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Combined Meetings of Sections.

SECTION OF MEDICINE AND EXPERIMENTAL MEDICINE AND SECTION OF SURGERY.

Ulcerative Colitis.

A COMBINED MEETING of the Section of Medicine and Experimental Medicine and the Section of Surgery was held to discuss ulcerative colitis.

S. J. M. GOULSTON (New South Wales) read a paper entitled "Ulcerative Colitis". He said that the term non-specific ulcerative colitis was used to cover acute and chronic enteritis and colitis of unknown ætiology, and was allowable in the present limited state of knowledge only to avoid the confusion of a complicated descriptive nomenclature. Misunderstanding was caused frequently by the use of the word colitis to mean spastic colon, a benign and purely autonomic disturbance of the colon. The word colitis should be reserved for the disease about to be discussed. Dr. Goulston said that his remarks were based on 138 cases of ulcerative colitis studied by the Gastroenterological Unit at Royal Prince Alfred Hospital during the years 1950 to 1957. The disease might run any kind of course. It might be fulminating from the start, or mild but persistent, scarcely worrying the patient for years until some disabling complication occurred. Clinical remissions were common, but the disease invariably recurred. The main site of involvement was in the recto-sigmoid or descending colon, but rarely the disease commenced in the right side of the colon. Involvement of the last few feet of ileum might follow the destruction of the ileo-caecal valve, or the ileum and the jejunum occasionally might be the initial site of the inflammation. Brooke had emphasized the clinical importance of recognizing the site and extent of the diseased area, and had classified his cases as ulcerative colitis proper when the whole colon was involved, as recto-sigmoiditis when the disease was confined to the rectum and sigmoid, and as entero-colitis when the initial lesion was in the small bowel. So far as one could judge, those differing clinical

states had a common basic pathology. Initially the submucosa became œdematous and there was an increase in lymphocytes and eosinophils. To direct vision the mucosa appeared wet, and a serosanguinous fluid oozed from it. If the mucosa was touched with a swab, it would readily bleed. The overlying mucosa might then ulcerate, and leucocytes were attracted to the site. Those ulcers were at first superficial, but if the inflammatory process extended beyond the *muscularis mucosae*, deep ulceration might ensue. Attempts to repair the epithelium went on simultaneously, and pseudohypertrophy occurred in the isolated areas of the remaining mucosa. McGovern and Archer had postulated a histamine-release phenomenon from the mast cells in the intestinal mucosa, giving rise to œdema, increased capillary permeability and spasm of smooth muscle. The initiating cause might be a nervous discharge with release of acetylcholine.

Dr. Goulston went on to say that, according to Brooke's grouping, 107 of the 138 patients had classical ulcerative colitis involving the whole colon, 22 had disease localized to the rectum and sigmoid, and nine had involvement of both small and large bowel. Each group had a characteristic clinical picture. Recto-sigmoiditis was characterized by the paradox of basic constipation in the presence of frequent motions. The frequent motions contained only blood, pus and gas, which came from the diseased area in the rectum. The attacks might be intermittent or the history might be a continuous one. Severe anæmia might result, and also spasms of left lower abdominal pain. The gastro-colic reflex might be stimulated merely by the drinking of fluids. Most of the 22 patients were in the age group 21 to 40 years, and the only complications were local, such as fistula and rectal stricture. No patients so far had developed malignant change or systemic complications. Two had had severe hæmorrhages requiring blood transfusion. There had been no mortality. In his experience that group responded well to local therapy. Fifteen patients were given antibiotic retention enemata ("Thalazole", penicillin and streptomycin) and the short-term results were excellent in nine cases, fair in five, whilst there was no response in one. More recently patients had been treated with hydrocortisone hemisuccinate sodium, 100 milligrammes being given as retention enemata by the slow drip method over a two-hour period for 10 to 14 days. Of five cases, the clinical response had been excellent in four and good in one. Rectal biopsy findings before and after cessation of treatment indicated that the œdema was consistently reduced, although there had not been much alteration in the cellular content in the submucosa.

Dr. Goulston further said that in ulcerative colitis proper, the whole of the colon and rectum was generally involved. The ileo-caecal valve usually became inefficient and spread of the disease into the last foot or two of the ileum occurred. The course might be fulminating and dramatic (seven cases), chronic insidious and persistent (57 cases), or intermittent with clinical remissions of varying lengths (43 cases). The age groups covered six decades. Complications were many, and included clubbing of the fingers, lesions of the skin, liver and joints, strictures and malignant change. Local complications (anal fissures and fistulæ and abscesses) were numerous. The main points in the medical management consisted of bed rest in the acute phases, a liberal diet with no restrictions, transfusions when indicated, measures to slow movement through the alimentary canal, reassurance and psychotherapy. Antibiotics were avoided with the exception of "Thalazole" and "Salazopyrin" (sulphonamide salicylate). Corticoids were found to be useful in the acute disease, and occasionally in the preparation of the patient for surgery. If the response was good, corticoids were continued for at least six months; if no improvement occurred, the treatment was abandoned at the end of two weeks.

Dr. Goulston then said that unusual forms of the disease in his experience included one case in which it began in the terminal portion of the ileum, caecum and ascending colon and spread to involve the transverse colon, while the left side and rectum were relatively clear. In addition there were nine patients with acute entero-colitis, of whom five had died. Generally such patients were acutely ill and rapidly lost weight, and electrolyte imbalance occurred. However, the onset might be insidious, and the patient might suffer from non-specific diarrhœa without blood or mucus. Steatorrhœa and finger clubbing were generally present. In such acute lesions involving both small and large bowel, surgery was contraindicated. All the patients who died in that group were subjected to operation. They were best treated with diet, fluid and electrolyte replacement and corticoids. The total number of patients submitted to surgery was 38 (35·5%).

Dr. Goulston said in conclusion that it was abundantly clear that knowledge of the disease was limited and had not advanced much in the last 10 years. By careful management, the patient could be tided over critical stages and supported and encouraged to live with the disease. In the acute initial episode, remarkable and long-lasting remissions might occasionaly be obtained with corticoids, psychotherapy or other therapy, but generally the natural history of the disease was one of a destroyed colon and systemic complications. Until new and powerful remedies became available to the physician, about 30% of the patients would require surgical removal of the diseased area. Correct timing of such procedure required considerable skill and judgement by both physician and surgeon working together as a team.

JAMES GUEST (Victoria) read a paper entitled "Ulcerative Colitis—Surgical Aspects". He said that there was general agreement that if the patient was to be restored to good health, the diseased bowel must be removed; but unfortunately that excision of the colon and, usually, the rectum necessitated also the establishment of an ileostomy. That was a grave and usually permanent step. However, refinements in surgical technique, with improved understanding of the physio-pathology of the established ileostomy, had greatly reduced the dangers of the operation, and improvement in ileostomy appliances had considerably simplified the problem of management for the patient. Dr. Guest said that his thesis was that in the present state of knowledge, the patient suffering from ulcerative colitis who required operation, was best served by the establishment of an ileostomy with removal of the colon and rectum (procto-colectomy) in one or two stages.

Dr. Guest went on to say that recent work had helped to solve some of the problems associated with the terminal portion of the ileum in that disease. In approximately 15% of patients coming to surgery, direct extension of ulceration into the terminal portion of the ileum was seen. That was found only in the presence of an incompetent ileo-caecal valve, and was retrograde extension from the right side of the colon and the caecum extending for approximately 12 inches into the terminal part of the small bowel. When it was recognized at laparotomy, the affected area was best excised. However, transection of the ileum through such an area seemed to be of little practical importance, as once divorced from the neighbouring colon, the ileal lesion appeared to resolve completely. The second type of ileal lesion was that described by Warren and McKittrick as "ileostomy dysfunction", essentially a subacute obstruction occurring at the ileostomy stoma. It was characterized by a profuse watery discharge from the ileostomy and colicky abdominal pain, and was most frequently seen in the first few weeks after operation. A gross fluid and electrolyte imbalance occurred, which resulted in death if untreated. In the more advanced cases ileal ulceration was seen, secondary to stomal stenosis; it was quite distinct from that seen in retrograde ileitis. The adoption of Brooke's method of direct mucocutaneous suture when making the ileostomy had almost eliminated ileal stenosis at skin level, and had considerably reduced the incidence of that complication. That suturing of mucosa to skin was a most important step in the formation of a good ileostomy. Dr. Guest said that the addition of three or four longitudinal slits on the serosal surface of the gut, as advised by Durham, facilitated ileal eversion.

Discusing the indications for operation, Dr. Guest said that surgery might be indicated in intractable cases in

which there had been no response to medical measures, in complicated cases, or in acute fulminating cases. Failure to response to medical treatment was becoming the most frequent reason for surgical intervention, and the decision required the closest cooperation between the physician and the surgeon. The failure to respond was relative, because practically all patients could show some response to the sheet anchors of medical care—bed rest, protein-rich diet, antibiotics and chemotherapy, vitamins and blood transfusion. He considered that conservative treatment had failed if the patient remained or became a chronic invalid as a result of uncontrolled diarrhœa, toxæmia or anæmia, and it was in those cases that the best results of surgery were obtained. The first year of ulcerative colitis was the time when death was most likely to occur, and it was in that group that a remission with corticosteroid therapy was most probable. In his experience the response to those drugs had been disappointing, and in a recent case the masking of a perforation by cortisone was certainly a contributory factor to the patient's death. That case emphasized the risk of continuing cortisone therapy when an early remission was not obtained.

Dr. Guest then said that complications of the disease might call for surgical treatment; examples were arthritis or pyoderma, and local changes affecting the colon, such as perforation, fistulæ, stricture formation or malignant change. The risk of carcinoma was a real one, particularly in long-standing cases. The primary disease might be mild or quiescent, and there might be little change in symptoms whilst that insidious pathological change was going on. The tumours were sometimes multicentric in origin, were difficult to demonstrate radiologically and often metastasized early. Early and radical surgical ablation of the bowel was required as soon as the diagnosis was made, but that was often not easy. Biopsy might be helpful, and a recent paper on the examination of colonic epithelial cells by Boddington and Truelove (1956) might help the surgeon to decide in which particular case of long-standing colitis he should advise operation.

Discussing the acute fulminating cases, Dr. Guest said that it was in those cases that the main mortality of the disease occurred and that recent surgical endeavour was showing some dividends. Medical treatment with steroid therapy had been disappointing; there was great danger that, in the hope of a remission, it would be continued too long. It was there that fine judgement was required, to decide the optimum time to abandon medical treatment in favour of surgery. The decision to operate must not be too long delayed. As long ago as 1943, Sir Hugh Devine had been convinced that ileostomy alone was of little value for the desperately ill patient; to terminate the disease the affected colon must be removed. A definite indication for urgent surgical intervention was the presence of local tenderness with increasing colonic distension. That type of patient was best treated by ileostomy and excision of the colon as far as the distal part of the sigmoid, the rectum being removed at second stage. Colonic decompression by means of a long tube passed under vision into the rectum when the abdomen was open had proved a useful manœuvre.

Dr. Guest then said that accumulated experience had shown that the operation of choice at the present time was ileostomy and procto-colectomy, in the majority of cases in one stage. There was no place for ileostomy alone, and most surgeons did not favour ileo-rectal anastomosis. In his opinion, there was a small place for that operation in cases of segmental colitis in which the rectum was normal, or in patients with some physical or mental disability which made ileostomy management impracticable. The operation might be used in young men to avoid impotence which followed removal of the rectum in approximately 50% of cases.

Dr. Guest finally said that the majority of patients were capable of managing their ileostomies, and led very full lives. However, they were liable to certain complications, intestinal obstruction and those referable to the stoma being most common. Adherent ileostomy bags had greatly simplified the problem of management for the patient, a very satisfactory one being the Torbot appliance. Experience in the United States and Great Britain had shown that patients could do a great deal for each other in the matter of rehabilitation, and that had led to the formation of ileostomy associations. In May, 1957, such an association, known as "Q.T. Australia", had been formed in Melbourne. Dr. Guest commended it to those present as an organization invaluable to the patients and of great assistance to all doctors interested in the problem of ulcerative colitis.

JOHN LOEWENTHAL (New South Wales), in opening the discussion, said that the subject was particularly suited for discussion as a combined medico-surgical topic. Probably the greatest authority in the English-speaking world was a surgeon, Mr. B. N. Brooke, Reader in Surgery in the University of Birmingham. Professor Loewenthal vividly recalled seeing a physician, Dr. Avery Jones, conducting a proctitis clinic at St. Mark's Hospital in London—a hospital which was almost exclusively surgical in its outlook. Watching Dr. Avery Jones with a glove on his left hand and a sigmoidoscope in his right had vividly emphasized to him the fact that most physicians were in truth frustrated surgeons. It was of some interest to see the number of people attending the proctitis clinic, as he thought that it was a disease that was neither common in Australia nor widely recognized as a disease entity. It was clear that most doctors thought that proctitis usually meant the early phase of a progressive ulcerative colitis.

Professor Loewenthal went on to say that one of the big advances was the technical perfection of the ileostomy which had now developed from Mr. Brooke's clinic. The excision of a round area of skin, and the turning back of the ileal mucosa and its suture to the cut skin margin had produced a great improvement in the functioning of those ileal stomata. Also, the rather dreary period of some months, during which time the ordinary ileostomy went through its maturation before it finally settled down, was now largely avoided. Further, it was clear that teamwork was required before, during and after the actual performance of the operation, and in that context Professor Loewenthal emphasized that the teamwork must not finish too early. The patient might recover from the establishment of the ileostomy and three or four days after the operation appear to be well balanced with regard to fluids and electrolytes; but it was still possible for him to go seriously awry in that respect for periods up to a week or 10 days after operation, and every care should be taken to recognize any such irregularity and to check it before it became of serious extent. Professor Loewenthal said that he was still bothered by the free exhibition of corticoids to patients before operation, and asked the speakers to give their views on those agents, especially in view of the possibility that poor wound healing might follow their use. At various times the effect of the autonomic nerves on the colon had been questioned as a source of additional derangement of the colon in colitis. He cited a patient who had one of the more usual complications of colitis, ulceration of the legs, who was treated *inter alia* by lumbar sympathectomy during a quiescent period. The patient had been subject to numbers of exacerbations of his colitis, all of more or less the same degree; but the exacerbation which followed sympathectomy was very much graver than any previous attack and, in fact, proved fatal. Professor Loewenthal said that that might be coincidence; but it was suggested that the removal of the restraining influence of the lumbar colonic nerves was something to be avoided in established colitis.

GRAYTON BROWN (Victoria) said that he wished to make three points. First, with regard to psychological factors in the disease, whether as causation or aggravation, he wished to make the observation that in spite of a rather serious permanent disability, an ileostomy, which one would suppose normally to be a serious psychological trauma, the patients at a Q.T. Ileostomy Club were an extraordinary group of happy people. No doubt ulcerative colitis had such a serious effect on general health that those patients had presented psychological problems before operation. It would seem, therefore, that irremediable

psychological upsets could aggravate the disease; but it was difficult to imagine that psychological troubles could be causative factors. Secondly, as far as chronic ulcerative colitis was concerned, the management at present was fairly clear cut, in that severely disabled patients usually desired, and were in fact entitled to, radical surgical treatment; at present that was proctocolectomy. Dr. Goulston's figure of six patients with carcinomatous changes out of a total of about 120 was lower than most gastro-enterologists found in their series. That was an additional reason for advising colectomy in chronic cases. Dr. Grayton Brown gave a warning that the apparent inactive rectal stump left behind in patients treated by subtotal colectomy was still a potential danger for the origin of carcinoma. He quoted the case of a patient who had married after subtotal colectomy and had not returned for review for nine months, when hopeless widespread carcinoma of the rectum was discovered. Dr. Grayton Brown's last point was the greatest problem in the disease—the management of the acute fulminating case in which the history was usually very brief. It required courageous medical advisers to advocate ileostomy (which would be permanent) and colectomy in those cases, and so he had been heartened to hear both speakers agree that that was the best line of treatment at present.

EDWARD WILSON (New South Wales) said that it had been suggested by Professor Loewenthal that proctitis was relatively rare in a surgical out-patient clinic in a public hospital, and that was so. Those patients were usually directed to a medical out-patient clinic, and then were either retained there or directed to the rectal clinic. For instance, he saw many such patients in his rectal clinic at Sydney Hospital, but they were practically unknown in his surgical out-patient clinic. The physicians had mentioned cooperation with the surgeons, and there was no doubt about its importance in many diseases of the gastro-intestinal tract; but, it seemed to him that that was often interpreted to mean team-work once the physicians had decided that operation was necessary. As the physicians had no powerful weapon in their hands for treating ulcerative colitis, Dr. Wilson suggested that team-work in those cases should date from the time when the diagnosis was first made.

Dr. Wilson went on to say that eversion of the full thickness of the bowel wall in the construction of an ileostomy had been mentioned by Dr. Guest, but that was by no means an easy manœuvre. Usually, attempted eversion of the ileum in the manner of Brooke finished up as a mucosa-to-skin junction, but without the spout-like effect for the ileostomy which greatly facilitated its management later. He had had more success with the mucosal grafted ileostomy technique of Turnbull; but he would like to hear more of the details of the method used by Dr. Guest.

ALLAN LEE (Queensland) said that the surgery of ulcerative colitis was a matter for the expert, and at least in one's earlier cases a formidable group of complications was likely to occur. He had seen several cases of intussusception through the ileostomy opening, one example of gangrene of such a prolapse and examples of severe watery diarrhœa with perforation of the ileostomy at the skin level. Nevertheless, when those complications could be avoided, the results of radical surgery in ulcerative colitis were dramatically successful.

I. R. MACKAY (Victoria) said that the incidence of liver disease (20%), arthralgia, rashes and mouth ulceration in Dr. Goulston's cases was noteworthy. Similar experience at the Clinical Research Unit at the Royal Melbourne Hospital had led to the belief that nutritional deficiency would not explain the liver disease in all cases. Dr. Mackay suggested that chronic ulcerative colitis might be a component of a multisystem disease process.

H. A. LUKE (Victoria) said that in any discussion of that subject there were several aspects which should not be overlooked, and which were of importance in the radiological assessment of ulcerative colitis. Recently, with Dr. N. T. Hamilton, he had reviewed the radiological changes in 57 cases of ulcerative colitis in which adequate films were available; all the cases had been seen at the Alfred Hospital, Melbourne. The following conclusions were reached. (i) In preparation for a barium enema, severe purgation must be avoided. Over the period of review castor oil was used in the preparation of the patients. In at least one case of ulcerative colitis that had produced an exacerbation of symptoms in a previously quiescent case, which continued for at least six months. If the patient was having loose motions, all that was required was a simple enema before the barium was given. They no longer used castor oil, having replaced it with "Sennakote" tablets. Also patients with ulcerative colitis were referred personally as far as possible, instead of by a request slip. (ii) Many cases were reported as "normal" in which, on review of the films, there was a slight but definite irregularity of the mucosal shadow, producing a shaggy appearance to the contour of the bowel. It appeared very difficult to detect the earliest changes on films which were not of optimum quality, and in that series 25% of the first-stage cases had been reported as "normal". (iii) Associated with the difficulty in recognizing the first radiological signs of ulcerative colitis there was the danger of diagnosing so-called unilateral ulcerative colitis, that term implying that the opposite side was normal. In that series, in all the cases of so-called unilateral ulcerative colitis, bilateral changes were found. That could be of great importance when the treatment, such as hemicolectomy, was based on erroneous interpretation of the radiological changes. (iv) In that series of 57 cases in five years, there were six cases in which a carcinoma occurred, with two sites in one case. No apparent relationship was found between the presence of polypi and carcinoma. Those polypi were usually inflammatory in nature, not neoplastic; they represented areas of oedematous mucosa, and it had been found that those pseudo-polypi were more common in the fulminating cases. Carcinomata attended to occur in the long-standing cases. (v) There was difficulty in distinguishing, radiologically, between a true stricture, an area of spasm and a stenosing carcinoma. In a number of cases, on the barium enema X-ray examination, there appeared to be areas of stenosis which were not found at operation. In one case a very smooth stricture was found to be due to an inoperable carcinoma. (vi) In a series of patients who were treated medically, and who had several radiological examinations over intervals of up to seven years, there was only one in whom there was any evidence of improvement in the radiological appearance, apart from diminution of the size of ulcers. In the remainder the radiological appearances suggested deterioration in the condition of the colon despite clinical improvement in most cases. Dr. Luke said that clinical and sigmoidoscopic examination gave a more reliable indication of the true state of affairs, but the radiological examination gave some idea of the state of the colon in the less accessible regions.

PATRICIA WILSON (Victoria) said that she disagreed with Dr. Goulston's statement that the pre-operative administration of cortisone made the surgeon's task easier. Dr. Wilson said the the administration of cortisone in ulcerative colitis might cause three side effects. (i) It might mask perforation and shock. (ii) It might induce adrenal suppression, so that after operation acute adrenal insufficiency occurred. That was most likely in the fulminating case, in which toxæmia also contributed to the adrenal insufficiency; but it might arise in any type of case in which cortisone or ACTH had been given. The degree of insufficiency did not necessarily correspond with the duration of administration of cortisone or with the dosage. (iii) It might cause œdema of the tissues, with increase of capillary oozing at operation. Dr. Wilson suggested that, far from making the surgery of ulcerative colitis easier, cortisone made the management of the patient more difficult for both surgeon and anæsthetist.

Dr. Goulston, in reply, said that corticoids were used only in the acute case, and were not used as a routine measure in the preparation of the patient for surgery; nor were they used in cases of fulminating disease. In the nine cases of ileo-colitis, the diagnosis had been made on

post-mortem findings in five, and in the other four by the presence of steatorrhœa on a four-day fat balance diet and the X-ray picture. The diagnosis of liver complications in patients with ulcerative colitis was made by liver biopsy.

SECTION OF NAVAL, MILITARY AND AIR FORCE MEDICINE AND SURGERY AND SECTION OF ORTHOPÆDICS.

The Effects of Falls from a Height.

A COMBINED MEETING of the Section of Naval, Military and Air Force Medicine and Surgery and the Section of Orthopædics was held to discuss the effects of falls from a height.

B. KEON-COHEN (Victoria) read the first paper. He took lesions incurred in parachute jumps as examples of injuries resulting from such falls. He said that there was actually no typical "parachute" lesion; injuries to the lower limb preponderated, and some of them illustrated special problems in management. Dr. Keon-Cohen discussed some of those in detail. The first was the "scrambled" foot, of which there were innumerable varieties. The foot rapidly became grossly swollen, and that precluded closed reduction. Operative reduction was usually easy, but the result was generally unstable. Suitably placed screws or wires would secure reduction, and the results were sometimes surprisingly good. Referring next to "aviator's astragalus", Dr. Keon-Cohen said that the common injury was a fracture through the neck, with or without dislocation; it was caused by forcible dorsiflexion at the ankle. Additional stresses would cause a variety of dislocations. Forcible plantar flexion, a rarer injury, sometimes resulted in complete dislocation of the astragalus, often without fracture. Many of the more severe injuries were compound. When they were not, and the astragalus was dislocated, radiological assessment followed by early reduction was essential, because of the tight stretching of the skin. Fractures through the neck were treated in plantar flexion, maintained for at least three weeks. Fortunately, most reductions were stable. Avascular necrosis followed only the more serious injuries, and preservation of any one of the three sources of blood supply to the bone was enough to maintain adequate vascularity. Surprisingly good results followed accurate reduction of the fracture and dislocation (if present). Astragalectomy usually gave an unsatisfactory result. Arthrodesis might be required at a later date, to deal with complications. Discussing fractures of the *os calcis*, Dr. Keon-Cohen said that they nearly always resulted from a fall from a height, even as low as a few inches. That bone when fractured behaved much like a wooden box upon which a heavy weight had been dropped. Treatment was primarily concerned with correcting any gross lateral spread by compression with the *redresseur*, and restoring the heel by traction. It was not the tuber-joint angle that mattered, but the restoration to the patient of a reasonable posterior tubercle of the *os calcis*. Dr. Keon-Cohen then discussed diastasis of the inferior tibio-fibular syndesmosis. He said that in recent years the tibio-fibular ligament had been more or less forgotten. In actual fact it was frequently ruptured, either partially or completely, sometimes without the occurrence of a fracture. That was often in fact the main injury in a severe sprain. Dr. Keon-Cohen described the various types of abnormality which might result in such injuries, and said that diagnosis, even with full radiological survey, was not easy. If there was any doubt as to the integrity of the ligament, fixation across the syndesmosis by means of a lag screw was advisable. Dr. Keon-Cohen went on to discuss spiral fractures of the tibia, and urged operative reduction and internal fixation as the treatment of choice.

Dr. Keon-Cohen then made some reference to knee injuries and to fractures of the spine. He said that fractures involving the knee were common and in general were best treated conservatively. Ligamentous injuries of varying degrees of severity sometimes occurred during parachute jumps. Sometimes, because of faulty jumping technique, the leg was caught and forcibly abducted by the suspension lines as they became taut in the "opening shock". The usual injury was a sprain of varying severity of the internal lateral ligament. However, cases were on record in which much more severe injuries had been sustained. The majority of ligamentous injuries at the knee should be treated conservatively by immediate immobilization, followed at reasonable intervals by exercises. The results were usually much better than would be expected. Operative repair was obligatory in avulsion or rupture of the patellar tendon. Many spinal fractures resulted from falls from a height. Dr. Keon-Cohen emphasized the fact that, while it had not been discarded, treatment by the hyperextension jacket was used much less frequently than previously. In a large proportion of fractures, it was only the upper portion of the body that was involved, and deformity was minimal. All such fractures, as well as all middle and upper dorsal fractures, were best treated by bed rest alone, followed at a suitable interval by hyperextension exercises.

W. SWANEY (Victoria) read the second paper. He said that the impacts produced by falls from a height had results similar to the impacts produced in motor-car accidents. Similar injuries therefore resulted. Dr. Swaney discussed fractures of the upper end of the femur, embracing sub-trochanteric and per-trochanteric fractures, and suggested internal fixation for both. He said that central dislocation of the hip instead of a per-trochanteric fracture might result from the same force. He described methods of reduction by traction, and suggested internal fixation when traction failed. Dr. Swaney then referred to dislocation of the hip in conjunction with associated fractures of the acetabulum or the head of the femur; he said that some of those injuries required operative treatment. He described the late complications of aseptic necrosis of the head of the femur in a patient, 18 months after dislocation of the hip. Dr. Swaney then described multiple fractures occurring in the one limb, and stressed the need for internal fixation of at least one of the fractures. He mentioned fractures and disruptions of the pelvis, and described a method of internal fixation of the pubes in pubic diastasis and sacro-iliac dislocation.

REAR ADMIRAL L. LOCKWOOD (Victoria) agreed with the importance of recognizing widening of the inferior tibio-fibular joint and was glad to hear that treatment was satisfactory.

AIR VICE-MARSHAL E. A. DALEY (Victoria) noted that modern ejection seats could cause some of the injuries referred to.

W. E. SPRING (Victoria) said that, as the speakers had indicated, the management of multiple fractures of one limb might present many difficulties. The situation appeared to have been studiously ignored by text-books on the subject. It might be possible to manage them by conservative methods. However, matters such as the degree of skilled attention available, the difficulties in maintenance and economic considerations might dictate a more radical approach. In those cases, internal fixation of one or more of the fractures was very helpful. Comminuted inter-trochanteric fractures might be more easily reduced if they were treated and internal fixation was applied with the patient in the prone position. Subjects for open reduction of pelvic fractures should be selected with great care. Reduction might be very difficult and should be attempted only by those experienced in that branch.

E. A. DALEY (Victoria) referred to the fact that the people with parachute injuries that had been described would, if they were aircrew, normally have been ejected from aircraft in the ejection seat. They would thus run the risk earlier of possible spinal injuries, and also later tearing or spraining of muscles during their first passage through the air from flailing of limbs, quite apart from any injuries which might be received at the time of landing.

SECTION OF NEUROLOGY, NEUROSURGERY AND PSYCHIATRY, SECTION OF OPHTHALMOLOGY, SECTION OF ORTHOPÆDICS AND SECTION OF PUBLIC HEALTH, INDUSTRIAL MEDICINE AND HOSPITAL ADMINISTRATION.

Modern Assessment of Injuries in Relation to Compensation.

A COMBINED MEETING of the Section of Neurology, Neurosurgery and Psychiatry, the Section of Ophthalmology, the Section of Orthopædics and the Section of Public Health, Industrial Medicine and Hospital Administration was held to discuss the modern assessment of injuries in relation to compensation.

P. MACDONALD TOW (Tasmania) read a paper entitled "The Psychological Aspects of Injuries". He said that for years medical practitioners had talked of compensation neurosis. Compensation neurosis was no different from other neuroses in the symptoms and signs which composed it or in the course it followed. It differed in that in its historical development the injury itself was a clearly related ætiological factor. It might be a clinical abbreviation but, as in all neurosis, the primary ætiological factor was predisposition. The event precipitated the neurosis. In Great Britain in 1957, 100 times as many days were lost to industry through neurosis as through strikes. If the injured patient needed primarily surgical treatment, the ultimate prognosis, if recovery was delayed, depended upon personal psycho-social complications. Elicitation and treatment of those complications by the physician or social therapist should be part of every clinical service.

EUNICE WILSON (N.S.W.) presented a paper on "The Assessment of Compensation in Injuries to the Eyes". She set out the percentage disability suffered by an accident subject because of the loss of an eye or the total or partial loss of sight of an eye in terms of corrected visual acuity of the affected eye and incapacity (percentage equivalent of total loss of one eye): less than 6/60, 100%; 6/60, 85%; 6/36, 75%; 6/24, 65%; 6/18, 50% (half vision); 6/12, 25%; 6/9, 10%; 6/6, nil. The assessment was on corrected vision except when the refractive error was due to the accident. For example, a 50-year-old man had been burning off rubbish in an incinerator when a bottle exploded and a fragment of glass entered his left eye, causing a wound of the cornea and a prolapse of the iris. The prolapse was excised and the patient made an uneventful recovery. The left visual acuity was reduced to 6/9 and corrected to 6/6 with +0·25DS/+0·75DC (axis 35°). His disability was 10% because the 6/9 vision was caused by astigmatism due to the accident. However, disabilities not involving simple loss of vision were not so easy to assess. For example, a telegraph linesman was standing on the ground while another linesman was lopping a branch from a tree 40 feet above him. The branch fell and hit him on the face, shearing the eyelids from his right eye and causing an extensive fracture of the maxilla. He was profoundly shocked on admission to hospital and after resuscitation was taken to the operating theatre, where every remaining fragment of the skin was salvaged to reconstruct the eyelids, and the raw areas were skin grafted. At a later operation Dr. Basil Riley reconstructed the floor of the orbit with a bone graft. The patient's present position was: diplopia except on looking straight ahead (50% disability); visual acuity 6/9 (10% disability). Some lid deformity and facial asymmetry would have to be taken into account when the final figure was assessed.

Dr. Wilson said that the degree or competence of the eye to accomplish its physiological functions was governed, according to Spaeth, by the following factors: (i) corrected vision for distance and near, (ii) field of vision, (iii) ocular motility with absence of diplopia, (iv) binocular vision; and the less important factors: (v) colour perception, (vi) adaptation to light and dark, (vii) accommodation. Discussing these factors in turn Dr. Wilson said that the corrected vision had already been described. With regard to fields of vision, she quoted the case of a man, aged 20 years, who walked into a partly closed garage door at work and sustained a *commotio retinæ*; when that subsided, he was left with a hole at the macula and absence of central field of vision. His disability was 90% of one eye. Loss of peripheral field of vision was assessed at a much lower figure. Glaucoma was a controversial field for compensation. A man had been passing a planing machine at work when a foreign body flew into his eye. He presented seven days later with acute glaucoma and a vision of light perception only. The condition was treated by iridectomy, and two weeks later the tension was normal, but the vision had not recovered. The disk was pale and deeply cupped, an appearance which could not be attained in such a short time; therefore no disability was allowed. Had the disk been normal in appearance, it was likely that the glaucoma would have been accepted. In the unlikely event of a chronic glaucoma being accepted for compensation, the defect would be in the field of vision. Discussing the third factor Dr. Wilson said that ocular paralyses were an important and controversial subject. Severe diplopia as in the case described earlier was assessed at 50%, but there were many lesser degrees to be considered. Of such a patient Minton had stated: "Such a workman may earn his pre-accident wages yet have lost some working efficiency and has become unfit for occupations requiring good binocular vision, e.g. work on scaffolding or requiring the climbing of ladders." Dr. Wilson quoted the case of a man, aged 40 years, who was feeding rubber into a machine to make tires when a wheel broke off and hit his eye with considerable force. One month later he noticed double vision. That was due to a weakness of the left inferior oblique muscle. Such a delay in experiencing diplopia in fractures of the wall of the orbit was not unusual. He was assessed as 10% for 6/9 vision, 10% for diplopia in one quadrant, with a total disability of 20%. Another man had been involved in a taxi-cab incident, as a result of which he had a traumatic mydriasis of the right eye and a paresis of the right lateral rectus muscle. He was allowed 10% for the traumatic mydriasis, 10% for the diplopia in one quadrant, with a total disability of 20%. Dr. Wilson described binocular vision as the ability to use two eyes together so that stereopsis or a sense of depth and distance was possible. She said that that was especially lost in aphakia, for after the removal of a lens, even if the corrected vision was 6/6, the two eyes could not be used together, since the object seen by the aphakic eye was 5/4 times the size of the object seen by the normal eye. Even with a contact lens the aphakic eye could not accommodate to focus on near objects. Monocular aphakia with vision correctable to 6/6 and with 6/6 in the other eye and full fields was assessed at a minimum figure of 70% disability. Discussing the remaining factors Dr. Wilson said that colour vision and adaptation to light and dark were unlikely to be met as compensation problems. Accommodation was of increasing importance in modern industry and was met particularly in aphakia and traumatic mydriasis.

Summing up, Dr. Wilson said that there was a considerable human element in the final assessment of percentage disability except in cases of simple reduction of vision, and the situation was further complicated by the fact that the percentage disability from various causes was not necessarily added as a simple total. The final figure, which in a case of severe injury would usually be decided in court, was one which must be advised by the ophthalmologist in the light of his own experience.

D. W. L. PARKER (Tasmania) read a paper entitled "Evaluation of Injuries in Relation to Compensation". He said that road and industrial accidents constituted the majority of all accidents. The present court procedure was outdated. Fairer evaluation of disability could be obtained by a medical board, one member to be selected by the plaintiff, one by the defendant, and one to be appointed by the judge. Appropriate specialists could be coopted. An anxiety state was present in all cases, and took one of three forms—exaggeration of symptoms, hysteria or frank malingering. Referring to the actual estimation of disability, Dr. Parker said that there was a real need for some planned and rational method of assessment. The

disability was considered in three categories—anatomical result, functional result and economical result. The assessment was made from consideration of all three factors. When definite anatomical loss had occurred, definite percentage disability could be accurately assessed. Dr. Parker gave as an example the application of the method to a fracture. He said that when the anatomical result was being considered, the relevant points were estimation of length, alignment, apposition and angulation. In estimation of the functional result, a subjective and objective assessment of joint movement and strength was required, and also of joint movement above and below the fracture. The points to be considered in estimation of the economic result were whether the patient was doing the same work as previously, or lighter or heavier work, whether he was receiving the same pay as previously, or more or less, and whether he was accomplishing the same volume of work.

HEDLEY LEGGO (New South Wales) said that the term "injury" had come to cover physical disability and many aspects of "ill health". That widening interpretation demanded a satisfactory appreciation of assessment values to provide an equitable programme for the consideration of the effects of "injuries". A common mistake in assessments was the attempt to assess a shortcoming caused by physical disability and/or ill health without a detailed appreciation of all the factors which occasioned the state requiring the assessment and further without a careful interpretation of the bodily deficiency in terms of function. Disability, in other words the state of being without or with decreased ability, demanded for assessment purposes an estimation of function. Function was the act of carrying out a duty or faculty or power of activity—it implied the usefulness of the part or the whole of the body. Loss of function could not be confused with anatomical loss or depreciation of physiological processes. Each or either of those could contribute to loss of function but seldom caused a complete functional loss in regard to the body as a whole. An assessment of a disability by the medical profession which could not be fully interpreted and appreciated by intelligent cooperating laymen was unsatisfactory and could cause the community and the subject considerable harm with its sequelæ of misunderstandings.

Setting out a basis for discussion of assessment factors, Dr. Leggo said that the "injury" (or incident) was closely associated with pre-injury and post-injury factors as they concerned the individual patient. Those three necessarily broad considerations directly produced a classifiable group of medico-surgical conditions. In turn those medico-surgical conditions produced a group of effects. Those effects afforded a tangible medical yardstick for the assessment of loss of function. In précis the basis was: A. "Injury" or incident causing disability. B. Pre-injury factors: (i) previous personality pattern of the patient; (ii) job or work integration; (iii) social-domestic integration. C. Post-injury factors: Adaptation-integration efficiency—(*a*) limitation of function, (*b*) alteration of living pattern, (*c*) enforced inactivity, (*d*) social-domestic. Each or any of those in varying reactions could produce a definable group of medical conditions: (i) physical disability, (ii) neuro-musculo-circulatory instability, (iii) psyche upset, (iv) psychiatric reactions. In turn those medical conditions produced effects: (i) physical limitations either localized to a member of the body or of the body capacity, (ii) residual organic medical conditions, (iii) pain, (iv) fatigue state, (v) psyche disturbances, (vi) psychiatric conditions.

Dr. Leggo set out the following criteria of an assessment: (*a*) The final assessment could be made only upon a permanent end result—a stabilized state of the injury or disability. (*b*) An interim assessment could be made only if the condition was not stabilized. (*c*) The assessment must be made in respect of the human being and not of the physical dysfunction, either of a member of the body or of physiological capacities. (*d*) The medical assessment must be contained within its own limitations and must be such that the assessing authority did, and other interested people could subsequently, appreciate the capacity of the patient; in that regard abstract percentage assessments could do serious disservice by not revealing what the patient could do and focusing too much attention upon a particular limitation which was not necessarily a limitation of engagement in occupation. (*e*) The assessment must be in respect of the patient's occupational followings at the time that he sustained the injury; what an injured individual might be able to engage in subsequently was an interesting rehabilitation excursion and thereby a medical part problem, but its assessment was beyond the scope of the medical practitioner. (*f*) The assessment must not be so loose that it became a "passport to a life of unnecessarily decreased function or even complete inactivity".

M. KELLY (Victoria) said that it seemed to be accepted by the meeting that patients who complained of pain after an injury, if they showed no physical signs proportional to the pain, were suffering from neurosis. However, it had to be remembered that those post-traumatic pains were equally common in people who had been injured, but not at work. Dr. Kelly said that he had been impressed by Dr. Leggo's emphasis on neuro-muscular defence mechanisms and their disorders. That was not a new problem. It was as old as medicine. Dr. Kelly said that when he was a medical student 30 years previously, he had been told about compensation neuroses. He had kept his eye open for such cases and he could say that he had never seen a case of compensation neurosis. He asked Dr. Leggo whether he himself used the term compensation neurosis.

Dr. Macdonald Tow, in reply, said that he had been impressed by Dr. Parker's presentation, and congratulated him on putting up a pretty compromise between the pedantic psychological formulation of the new concepts concerning the sequelæ of injuries and the attitude dictated by shrewd common sense. Dr. Parker had rightly emphasized the very real day-to-day demands of the patients, the courts and the lawyers. Dr. Tow said that he wished to stress the fact that he fully realized that in the hard school of practice they might all fall short of their ideals. That was usually through their own personal limitations. They became busy, were pressed to get on with other patients' treatment, and lacked the time and strength to tackle those external agencies.

In the implied disagreement between Dr. Parker and Dr. Rank, who had said that functional loss only should be assessed, he himself was heavily on the side of Dr. Parker. He might even go so far as to say that if, as Dr. Rank had suggested, physicians were to stop short in their appraisal of the patient at the simple single quantitative assessment of the objective lesion itself, they would fall very short of their responsibilities as clinicians, quite apart from their further and wider responsibilities. Those, he thought, as Dr. Parker had implied, they could properly take unto themselves if they wished to help their patient. Certainly the judges and juries were not able to secure expert appraisal from any other sources. There were, of course, many schools of thought in psychological medicine on that topic. As some of those present knew, he belonged to that which believed in sticking pretty narrowly to their own clinical problems, for those were large enough. By and large, he abhorred the idea that, in the present state of knowledge, they should go delving into matters in the community at which they were as yet only amateurs themselves. Therefore, in coming out on the opposite side, he felt strongly in that particular instance. He thought, for example, that if there were aspects which the court itself could judge, it might be a simple physical aspect of injury or disability, shortening or limitation or loss of function. That could be assessed by intelligent laymen. But certainly, if there was an area where it would be wrong to leave them to their own devices, it was the area of the psycho-social and psychosomatic factors. Obviously he agreed with Dr. Parker that it would be an ideal to appraise all that in an unbiased way, and he felt that Dr. Parker was talking of ideals just as much as he himself was. That should be arranged in some way which would lead to the availability of the most unbiased kind of evidence and the most objective kind of clinical appraisal to the legal authority which had to make the final arbitration.

Dr. Macdonald Tow went on to say that those remarks led in to his single criticism of Dr. Leggo's otherwise

comprehensive presentation. He felt that there, too, there was such a meticulous preoccupation with the multiplicity of factors one could see, feel, hear, measure and palpate, that far too little consideration was being given in industry to the motivational and emotional aspects which influenced all those factors, and which often had an overriding influence. Frequently that was the one determining factor on which the patient's whole attitude to life, and his actual psycho-social adjustment or maladjustment, would depend.

SECTION OF NEUROLOGY, NEUROSURGERY AND PSYCHIATRY AND SECTION OF PÆDIATRICS.

Behaviour Problems in Children.

A COMBINED MEETING of the Section of Neurology, Neurosurgery and Psychiatry and the Section of Pædiatrics was held to discuss behaviour problems in children.

W. S. RICKARDS (Victoria) read a paper entitled "Behaviour Problems in Childhood", in which he discussed some aspects of the genesis and significance of behaviour disorders in children through the various stages of development, and gave a method of approach to the elucidation of the many factors involved.

L. R. RAIL (New South Wales) read a paper entitled "Behaviour Disorders of Organic Origin". He said that organic behaviour disorders were due, at least in part, to brain damage or dysfunction. He drew attention to the relation of hyperkinesis with a disturbance of attention mechanisms, and mentioned the possibility that the hypermotility was evidence for disturbed perception. Dr. Rail went on to say that temper tantrums might have their origin in hippocampal damage or in other organic disturbances of the Papez circuit. Bizarre behaviour occurred in association with epilepsy, especially that of temporal lobe origin. Self-induced photogenic seizures and petit-mal status were associated with odd behaviour. Dr. Rail said that the neurological examination should include tests for fine coordination, visuo-motor defects and also parietal lobe abnormalities. Postural reflexes, motility, play patterns and anxiety level should be assessed. The relation of diffuse slow activity in the electroencephalogram to organic brain damage was not well defined. Focal abnormalities and epileptic discharges were more certain evidence of organic disease. Dr. Rail finally dealt briefly with treatment, and said that temporal lobectomy and hemispherectomy had their indications and could achieve good results.

ROBERT SOUTHBY (Victoria), in a paper entitled "Behaviour Problems in Children as Met with by the Pædiatric Physician", said that he proposed to refer to some behaviour problems which had a definite physical basis as the underlying cause. The first group was concerned with feeding, sleeping and control of bowel and bladder. Dr. Southby said that the main problem with feeding was difficulty in maintaining what the mother regarded as an adequate intake for her growing child. The infant might vomit shortly after taking a drink, the toddler might resent the feel of semi-solids when they were added to the menu, the school child either forgot to take his cut lunch or was in such a hurry to reach school early that he had neither time nor interest to eat his breakfast, and the adolescent had various reasons for his dislike for food. Some hyperkinetic children were like the baby car which did a hundred miles to the gallon—essentially efficient little engines requiring a minimum of fuel for a maximum of energy. Careful inquiry and clinical examination would often reveal such conditions as pyloric spasm or stenosis, œsophageal reflux with perhaps associated hiatus hernia, umbilical, inguinal or diaphragmatic herniæ, or similar mechanical basis for the trouble. Difficulties with sleeping included not going to sleep for some considerable time after being put to bed; waking a few hours after going quickly to sleep, or always waking very early in the morning; waking with the slightest noise or light in the room, or being disturbed by nightmares or dreams; and sleep-walking. Careful search might often reveal flea bites, mosquito bites and urticarial rash or sunburn, or the presence of a threadworm infection, muscular cramps or other local cause of the discomfort; some children appeared literally afraid to go to sleep lest they miss something. Disturbances of bowel control presented considerable clinical problems. Recurrent bouts of so-called "diarrhœa", in a child who was otherwise healthy, were often due to hypochlorhydria or achlorhydria and responded dramatically to treatment. So-called "diarrhœa" might be associated with underfeeding or starvation at the breast, indicated by small liquid brown motions containing very little actual fæcal material; treatment was extra feeding. Constipation might be shown to be due to thyroid deficiency, to true Hirschsprung's disease, or, if accompanied by a constant slight seepage of thin fæcal material, to encopresis, in which the lower portion of the bowel was loaded with hard impacted fæces. If the constipation was accompanied by severe spasmodic pain when the bowels were acting, and if the large firm mass when passed was streaked with blood, anal fissure should be looked for. Troubles with bladder control most commonly appeared as difficulty in holding the urine. It was important to differentiate between true nocturnal enuresis and such conditions as renal incontinence, hypospadias, patulous urethral orifice in the female and a congenital anomaly of the urinary tract; the last-mentioned condition should always be suspected if the urine was constantly infected. A certain proportion of children with nocturnal enuresis were cured by simple medical treatment; they were not all suffering from purely psychiatric problems.

Dr. Southby went on to say that habit spasms or "tics" might be the cause of numerous types of changed behaviour in children; for example, movements such as blepharospasm, grimacing, shoulder shrugging and head nodding or jerking frequently drew the attention of the parents or school teachers, and the movements themselves were sometimes responsible for other children in the class at school being reprimanded or even punished for unruly behaviour.

Dr. Southby said that pain of varying type might be recurrent or persistent, and varied greatly in its nature and time of occurrence. Children suffering from tonsillitis, tonsil and adenoid infections, earache or dental troubles had a good deal of pain, perhaps at frequent intervals, as a result of which they became cross and irritable, and disinclined for food, and possibly lost sleep at night. Pain involving the abdomen might be due to numerous causes from food disturbances to infections, and from trauma to tumour. The gastro-intestinal or urinary tract might be involved; a common entity was recurrent appendiceal colic. Conditions involving the hip joint or spine must always be remembered as they might cause referred pain presenting in the abdomen. Persistent or intermittent joint pains, especially of the lower limbs, might give rise to considerable disability and eventually prove to be due to a subacute type of rheumatic infection. Headache, if repeatedly complained of by the child, must always be given serious consideration, because it was most likely to be due to sinusitis, migraine or a serious intracranial lesion. In recent years children had become apprehensive as a result of the pain inflicted through numerous intramuscular injections, many of which were unfortunately not really necessary.

Dr. Southby said that sometimes changes in the behaviour of children were associated with the presence of foreign bodies, under the skin, or in the nose, eye, ear, vagina, urethra or anus. They might also be inhaled or swallowed.

At puberty there was a great demand on the constitution in various directions such as rapid physical growth, stress of examinations at school, with lessons becoming more serious, and sport, putting a heavy demand on physical strength. A high proportion of the children reacted unfavourably to the combination of demands associated with the advent of puberty. Some could not stand the pressure, and the problem became urgent.

Mothers were sometimes concerned by what they described as peculiar behaviour of a baby, and inquiry revealed the occurrence of masturbation. At school age the habit was often induged in as a result of having observed others. During the approach to the pre-puberty age, if indulgence had been frequently repeated, it might lead to malaise, irritability, fatigue and inability to concentrate upon lessons, and a changed disposition at home; that was very worrying for the parents, and might be puzzling for the doctor should the possibility not be suspected.

Change of disposition might accompany various other conditions. Thyroid deficiency might be evident at or shortly after birth, or it might be present in a young child. If it was at all pronounced there was no doubt of the clinical picture, but some of the less severe degrees of thyroid-lack might be much more difficult to recognize. The response to treatment was usually dramatic and gratifying to parents and physician alike. Vitamin deficiency gave rise to definite changes in disposition. The most striking example occurred in scurvy, with an irritable, whining, unhappy and apprehensive infant; an adequate supply of vitamin *C* proved more efficient in treatment than sedatives. *Diabetes mellitus* might present itself in the early stages with a profound change in the child's disposition. He became peevish, irritable and petulant, not wanting to play games, perhaps easily fatigued, and even unduly drowsy. With thirst, polyuria and the irritant action of sugar-containing urine, marked excoriation in the perineal region might lead to restlessness in school with additional undeserved punishment. Stabilization with insulin reproduced the child's normal behaviour. Intracranial lesions were amongst the most difficult from the diagnostic aspect, particularly the space-occupying lesion. Should it be gradually increasing in size, considerable time might elapse before the nature of the trouble became evident. More rapid progress would produce earlier and more dramatic signs. On the other hand the after-effects of a severe intracranial condition might completely change a child's disposition and behaviour; examples were post-traumatic, post-encephalitic and post-meningitic changes. Anal fissure, producing spasmodic pain during and immediately after defæcation, would entirely alter a child's disposition. A normally placid individual would become irritable, peevish and miserable, with colicky spasms or tantrums, in which he might be quite uncontrollable. Pink disease might give rise to considerable change in behaviour and general disposition, with anorexia, irritability, sweating and insomnia. The natural left-hander who had been forced to use his right hand at school might present a completely altered personality, with stammering or jerky movements resembling chorea or *petit mal*. With a readjustment of conditions and a reversion to the natural left hand he became more contented and returned to his normal personality.

Inattention, first noticed at school, where the pupil might be wrongly punished, or at home, might result from *petit mal*, the onset of which was often quite insidious, from chorea, producing restlessness in class, twitching or grimacing at other children, or clumsiness at table, and from wax in the auditory canals, with resultant impairment of hearing. Tantrums could cause anxiety as breath-holding attacks, head-banging, head-rolling or so-called "nerve storms". The combination of anorexia, persistent vomiting and loss of weight, especially in older children, could provide one of the most difficult problems of all; it might be the result of such conditions as œsophageal reflux, hiatus hernia or even peptic ulcer, and of hysteria, *anorexia nervosa*, schizophrenia or a silent brain tumour.

In conclusion Dr. Southby made a plea for careful inquiry and history-taking and for equally careful clinical examination in the investigation of behaviour problems.

ELIZABETH TURNER (Victoria) referred to Dr. Rail's statement that the control of seizures in certain cases produced further emotional disorder, and wondered whether such control would be a good or bad thing.

Dr. Rail replied that only in the rare temporal lobe epilepsy did behaviour become worse when the seizures were controlled.

W. H. TRETHOWAN (New South Wales) asked about the mode of action of amphetamine. He wondered whether it acted by heightening the level of awareness, thus improving perception as in some epileptics.

Dr. Rail, in reply, admitted that shortness of time had caused him to leave out any reference to amphetamine. It did have its effect on the sense of awareness, and that was why improvement was seen in post-encephalitic states and in certain epileptic states. Electroencephalographic tracings from patients taking amphetamine usually showed a large amount of fast activity with suppression of the alpha rhythm.

I. A. LISTWAN (New South Wales) asked why left-handedness appeared to be so frequent in Australia.

Dr. Southby, in reply, said that it was realized clearly in Australia that natural left-handers would be in trouble if they were forced to use their right hands, and when examined by doctors they were often put back to left-handed use. In those cases their behaviour frequently improved. In the U.S.A., some large manufacturing concerns arranged for a proportion of their machines to be fitted for left-handed control. He could not say why there there were more left-handers in Australia.

SECTION OF NEUROLOGY, NEUROSURGERY AND PSYCHIATRY AND SECTION OF PATHOLOGY, BACTERIOLOGY, BIOCHEMISTRY AND FORENSIC MEDICINE.

Virus Diseases of the Central Nervous System.

A COMBINED MEETING of the Section of Neurology, Neurosurgery and Psychiatry and the Section of Pathology, Bacteriology, Biochemistry and Forensic Medicine was held to discuss virus diseases of the central nervous system.

J. J. BILLINGS (Victoria) read a paper entitled "Virus Diseases of the Central Nervous System", which he discussed in five groups. Discussing first the infections which involved predominantly the grey matter, Dr. Billings said that the most important of those in Australia was poliomyelitis itself. In the second group, in which the grey and white matter of the nervous system were extensively involved, the infections due to the arbor viruses were the most important. Australian "X" disease and Murray Valley encephalitis were considered to be identical infections, having as their principal host various water birds and being transmitted by the bite of a culicine mosquito. Dr. Billings said that the third group comprised the post-infectious demyelinating disorders. Recent experimental evidence suggested that they had essentially an allergic basis, and modern theories suggested that disseminated sclerosis might be explainable in similar terms. The final group was that of meningo-encephalitis, of which the commonest causes were mumps, poliomyelitis and the ECHO viruses. Dr. Billings finally referred to the recent epidemic of ECHO virus meningitis in Victoria.

A. A. FERRIS (Victoria) read a paper entitled "Virus Diseases of the Central Nervous System". He said that he proposed to make an attempt to formulate a simplified classification which might be of use in clinical work for the virus infections of the central nervous system. Four main groups were identified, encephalitis, paralytic poliomyelitis, infective polyneuritis and aseptic (or virus) meningitis. Dr. Ferris then subdivided those groups as far as possible according to the nature of the ætiological agent. He then said that the most commonly seen infections at Fairfield Infectious Diseases Hospital over the preceding 12 months were aseptic meningitis due to ECHO virus, aseptic meningitis due to mumps virus, post-infection encephalitis, infective polyneuritis and poliomyelitis. Dr. Ferris finally briefly discussed changes in the cerebro-spinal fluid, the isolation of viruses and serological tests for the common viral infections.

D. M. MCLEAN (Victoria) read a paper entitled "The ECHO Viruses". He said that enteric viruses had been

isolated from patients during outbreaks of aseptic meningitis in East Anglia during 1955 and 1956 (mouse pathogenic strains of ECHO-9 virus) and in Minnesota during 1956 (Coxsackie B5 virus). Rising titres of neutralizing antibody in paired sera from patients confirmed that those viruses had infected patients in each outbreak respectively. Dr. McLean mentioned other recent epidemics of aseptic meningitis, in which ECHO-4 virus and ECHO-6 virus had each borne an ætiological relationship to the outbreak. He said that in infection with the ECHO viruses, variation in the symptomatology ranging from no clinical illness to the presence of a morbilliform rash with or without meningeal involvement had been encountered. Dr. McLean finally contrasted outbreaks of aseptic meningitis, in which a wide range of different serotypes of virus caused the disease, with the clinical and virological picture of an epidemic caused by one antigenic type of virus.

S. F. McCULLAGH (Territory of Papua and New Guinea) said that he wished to discuss a case in the hope that someone would advise him as to diagnosis and treatment. The condition appeared to be a clearly defined entity occurring only amongst the daughters, but not all of them, and in one granddaughter of a man of the Finschhafen subdistrict of Morobe district. The granddaughter affected was a daughter of a daughter of that man. Dr. McCullagh said that he had examined only one patient and had received his description of the disease from the father and grandfather of all the patients—who, it should be said, had not seen any patient in the terminal stages, for the disease was invariably fatal. Only females had been affected, and those in infancy, childhood or adolescence. The onset was abrupt and characterized by a high intermittent fever, pleuritic pain without cough or sputum and headache without meningismus. That episode lasted about one month and confined the patient to bed. A week or so after abatement of the onset there was a synovial effusion of the wrist, the ankle, the small joints of the hand and foot and sometimes of the knee with pain in those joints and an accompanying low fever. When that episode abated there developed over the small joints of the foot, notably the fifth metatarso-phalangeal joint, tense cystic swellings, which in the patient he had seen resembled ganglions; they remained for the rest of the patient's life. The fingers became spindle-shaped. From the onset the patient was unable to walk without hand support. Sitting, the patient was apt to fall over backwards, and at first she might recover herself directly; but later she had to roll onto her belly to do that, and later still lay helpless. Emaciation progressed relentlessly despite abundant food, good appetite and formed stools. There were at times tremor of whole large muscles (for example, the trapezius) and ceaseless small movements of the hands, which were usually held one in the other; manual dexterity decreased as the disease progressed. There were episodes of low remittent fever, occurring at about monthly intervals and lasting some four or five days. The patient remained cheerful and intelligent. The progress of the disease was relentless and death was invariable, occurring some one, two or three years after the onset.

Dr. McCullagh said that in the only patient he had seen there were those findings already described, together with a palpable spleen (almost certainly malarial) and a partial forward dislocation of the carpus on the radius, the wrist being held customarily in right-angled flexion. X-ray examination of the forelimb revealed osteoporosis. The child failed to react to the Mantoux test (dilution 1:10).

P. L. BAZELEY (Victoria) asked whether the rash described in overseas cases of ECHO-9 infection was seen in the Fairfield cases of ECHO virus infection.

Dr. Ferris replied that most of the Fairfield cases were type 4, in which a rash was unusual. The type 9 infections that had been seen, though small in number, had not been associated with rash.

E. F. THOMSON (New South Wales) questioned Dr. McLean on his evidence for labelling some of his cases "aseptic meningitis" when no lumbar punctures had been performed.

Dr. McLean replied that stiff neck was a prominent feature in the cases in question.

Dr. Bazeley questioned the validity of the group labelled "allergic encephalomyelitis" in Dr. Billings's paper. He thought that the early failures and accidents that attended the attempts to immunize animals and humans with formalin-treated monkey cord infected with poliomyelitis virus were the result of living virus still being present in the vaccine, and not of any immunological reaction due to the brain tissue.

E. L. FRENCH (Victoria), in reply to Dr. Bazeley's question, said that the antigenic material responsible for the experimental condition in animals had been chemically purified and found to be associated with the myelin. Furthermore, the histological appearance of the lesions in human and animal material—namely perivascular demyelination—was fairly characteristic and hardly to be confused with the usual virus infections of the central nervous system.

SECTION OF NEUROLOGY, NEUROSURGERY AND PSYCHIATRY AND SECTION OF RADIOLOGY AND RADIOTHERAPY.

Cysts of the Spinal Canal.

A COMBINED MEETING of the Section of Neurology, Neurosurgery and Psychiatry and the Section of Radiology and Radiotherapy was held to discuss cysts of the spinal canal.

R. S. HOOPER (Victoria) read a paper entitled "Cysts of the Spinal Canal". He said that cysts of the spinal canal tended to show several common characteristics: a long history, radiological abnormality and, in general, a good prognosis. Considering first the vertebral column, he said that infestation by hydatid cysts had been the only vertebral lesion encountered in his experience. When the bone was infiltrated with daughter cysts, the prognosis was poor; if the cysts lay in the paravertebral tissues without bone involvement, there might be good prospects for recovery. Of cysts which might arise from the spinal theca, there were three distinct varieties: (i) the congenital dural cyst, (ii) the acquired dural cyst or post-traumatic meningocele, (iii) the sacral nerve roots of Tralov. Cysts arising from the leptomeninges were rare and appeared to arise as a result of long-standing inflammatory changes. An important type of cyst which might occur within the subarachnoid space and occasionally within the cord itself was the dermoid. Such cysts might produce compression of the cord or of the roots of the *cauda equina*, but more frequently they became infected and gave rise to meningitis in early life. Intramedullary lesions exhibited a range of pathological variation from hydromyelia to syringomyelia and cystic degeneration of the intramedullary glioma. *Spina bifida cystica*, a term which included the common lumbar meningocele and meningomyelocele, also included a number of other interesting abnormalities.

H. A. LUKE (Victoria), in a paper entitled "The Diagnosis of Benign Spinal Tumours: Radiological Aspects", confined his remarks to the two commonest intraspinal tumours, meningiomata and neurofibromata. He said that Rasmussen *et alii*, in an analysis of 557 intraspinal tumours, had shown that neurofibromata accounted for 29% and meningiomata for 25%. The next most common group was the intramedullary tumours (11·5%). In most series meningiomata were slightly commoner than neurofibromata. The maximum age incidence of meningiomata was higher (55 years) compared with neurofibromata (35 years). About 85% of spinal meningiomata occurred in women, with no sex preponderance for neurofibromata (Bull). The distribution of neurofibromata was widespread throughout the spinal canal, whereas the meningiomata occurred much more commonly in the dorsal region than elsewhere; a few occurred in the cervical region; they were unusual in the lumbar region. The points mentioned could provide valuable pointers in

interpretation of plain X-ray films and myelograms. Neurofibromata, particularly if extradural in position, commonly produced erosion of the pedicles of the spinal canal visible in the antero-posterior films, as described by Elsberg and Dyke, or enlargement of the intervertebral foramina, visible in the lateral or oblique films. Those changes occurred in about 45% of all neurofibromata; Bull showed that 18 out of 24 extradural neurofibromata produced changes in the plain films, but 24 intradural neurofibromata produced no changes. The latter required myelography for localization, whereas in the extradural group one could often dispense with myelography altogether. With myelography it was not possible to distinguish the intradural group before operation from meningiomata and other rarer intradural tumours. A review of the literature suggested that fewer changes were visible in the plain films in spinal meningiomata. Buckstein showed changes in the pedicles in only 10%, and the same figure was given by Bull, who reviewed 59 cases. Calcification was almost invariably present in small quantities when spinal meningiomata were examined histologically, and it should, therefore, be possible to demonstrate that radiologically. However, there were relatively few references to be found describing the radiological detection of calcification in the tumours. Elsberg had commented on the disappointingly low incidence of radiological appearance of calcification in such cases, and had predicted that the improving quality of plain radiography should lead to many more cases of spinal meningioma being diagnosed before myelography.

Dr. Luke went on to say that during 1955-1956, while holding a research fellowship from the British Empire Cancer Campaign, he had reviewed the radiological changes in some 540 cases of cerebral and spinal meningioma in which operation had been performed by Mr. Wylie McKissock over the past 20 years. There were, in all, 79 spinal meningiomata. The present paper formed a small part of a complete survey which was being prepared for publication. When there were films of adequate quality available for review, and the survey covered 20 years including the war years, the approximate incidence of flattening or more definite erosion of the pedicles was 20%. In only two cases did the tumours occur in the lower lumbar region, and in both cases there was erosion, not of the pedicles, but of the posterior aspects of two adjacent vertebral bodies. In several cases the pedicles of one side of the spinal canal were flattened, whilst on the other side they appeared normal in contour. In each case it was found, both on myelography and at operation, that the tumour lay mainly on the non-eroded side; it would therefore appear that the tumour might protect the cord from erosion and that the pulsating cord, not the tumour, was responsible for erosion of the pedicles. On carefully measuring the interpedicular distances in a few cases it was found that the distance between the pedicles was actually slightly less opposite the site of the tumour than at adjacent vertebræ; radiologically that appeared to be due to "roughening" of one pedicle, but whether the appearance was due to bone stimulation in the pedicle, as occurred with cerebral meningiomata, or to calcification in the base of the tumour, had not been determined. In some cases it appeared to be due to the stimulation of bone in the pedicle but that might not always be the case. In one case there was quite a long spike of bone passing downward from the pedicle, associated with slight flattening of the opposite pedicles, and a little calcification in the region of the tumour, which surrounded the spike of bone; in that case it appeared certain that it represented bone formation in the tumour simulating a hyperostosis on the pedicle, for there was no evidence of abnormality on the pedicle after removal of the tumour.

Dr. Luke said that at first, in reviewing the films, he had not appreciated the nature of the calcification in the tumours, and he had missed calcification which he was later able to recognize. However, by increasing the contrast by the use of an aid to film viewing (Mattsson) and with increasing experience he had found that it was possible to see some evidence of calcification in more than 50% of spinal meningiomata — the exact incidence depending mainly on film quality. In some cases there was obvious calcification which had been missed by several observers because of lack of appreciation of the type of change which one should expect. Calcification in spinal meningiomata occurred mainly in three forms: (i) a diffuse increase in density owing to widely scattered calcospherites; (ii) concentration of the calcospherites mainly beneath the capsule of the tumour, which outlined the tumour edges on radiography; (iii) granular accumulations of calcospherites to give the type of tumour described by Virchow as a psammoma—a sand tumour—sometimes progressing to bone formation within the tumour. The first type, giving a diffuse increase in density within the tumour, was very hard to pick radiologically. However, the second and third types could be seen, but with difficulty. They were seen only on carefully analysing the suspected area for abnormal shadows in radiographs of optimum quality which must be free from artefacts. Culver *et alii* had found the tumours in their five cases more easily demonstrated in the lateral films, but that had not been Dr. Luke's experience—about equal numbers were visible in antero-posterior or lateral films.

Dr. Luke said that it was quite likely that the observation had little practical value. Where there was good clinical localization of a spinal tumour and the radiologist was allowed to have the benefit of adequate clinical notes, his task was made somewhat easier in looking for the faint areas of calcification. Also after myelography, when a tumour had been demonstrated, the plain films should be reviewed for evidence of calcification; or the calcification might be easily visible in the myelogram films, but could then be overlooked. If it was seen, one could give a confident diagnosis of meningioma, for, almost without exception, a calcified intraspinal tumour was a meningioma. That might be of some importance to the neurosurgeon, as the prognosis after removal of the tumours was very good. Cushing had stated that the removal of a benign tumour from the spinal canal was one of the most gratifying operations in the whole of surgery.

SECTION OF OBSTETRICS AND GYNÆCOLOGY, SECTION OF PATHOLOGY, BACTERIOLOGY, BIOCHEMISTRY AND FORENSIC MEDICINE AND SECTION OF SURGERY.

Urinary Tract Infections.

A COMBINED MEETING of the Section of Obstetrics and Gynæcology, the Section of Pathology, Bacteriology, Biochemistry and Forensic Medicine and the Section of Surgery was held to discuss urinary tract infections.

R. G. WORCESTER (Victoria) read a paper entitled "Urinary Tract Infections". He said that the close anatomical relationship between the urinary and genital canals in the female was responsible for the frequent occurrence of urethritis, cystitis and pyelitis resulting from infections of the genital tract. Trauma and urinary stasis played their part. Dilatation of the ureters and consequent urinary obstruction were the cause of pyelitis of pregnancy, which was common and acute and might be serious. Vaginal operations interfered with the physiological processes of the bladder, and necessitated frequent catheterization or the use of an indwelling catheter. Urinary infection was a common result, and therefore the amount of residual urine should be kept low, and great care should be taken with the technique of catheterization. Chronic interstitial cystitis must be recognized and treated before any gynæcological operation was undertaken. Dr. Worcester finally described the principles of investigation and treatment, and emphasized the importance of eradicating infections of the genital tract.

E. F. THOMSON (New South Wales) read a paper entitled "Urinary Tract Infections", in which he said that such infections should be regarded as those conditions in which bacteria were present in the kidney and the urinary

tract. Infections of the urinary tract might be pyelonephritis (sometimes with necrotizing renal papillitis), pyelitis, cystitis, urethritis, prostatitis, seminal vesiculitis and tuberculosis. Rarely actinomycosis and moniliasis of the urinary tract might occur. As an aid to diagnosis and a guide to prognosis, careful laboratory examination of the urine was necessary. That should include careful collection and handling of the specimen, standardized laboratory examination and some attempt at least at standardization of interpretation of results. Therapy must be a careful combination of removal of the cause and suitable drug treatment. Absolute reliance should not be placed on antibiotic therapy. During antibiotic therapy, the emergence of resistant strains of the infecting organism might present a serious problem.

N. J. BONNIN (South Australia) read a paper entitled "Management of Infections of the Urinary Tract". He said that a normal urinary tract did not readily become infected. Predisposition to infection might be due to general causes as well as local, and general examination and attention to health were important. Recurrent or persistent infection was in most cases a focal infection with recurring spread. In the female patient recurrent infection might spread from infection of the genital tract. The most common focus of infection was in the urethra, and stricture often associated with chronic urethritis was of frequent occurrence. In the male the prostate gland was a common site of persistent infection. A urethral stricture often presented as a persistent cystitis. However, prostatitis should be diagnosed only on adequate evidence. Grossly purulent prostatic fluid, palpation of an abscess or subsequent irregular scarring, a characteristic appearance with the panendoscope and recovery of the organism were the criteria of infection. A painful tender prostate often occurred in young males without infection. A few leucocytes were present in normal prostatic fluid; threads in the urine meant inspissated secretion and not necessarily anything more. Dr. Bonnin said that in the upper part of the urinary tract the term "pyelitis" should be discarded and "pyelonephritis" substituted. In pyelonephritis following catheterization or surgery renal tenderness might be lacking. Chronic pyelonephritis was a common disease, and the diagnosis was often missed. Recurrent bouts of acute or subacute pyelonephritis caused progressive destruction of renal parenchyma, and the end came with renal failure. At that stage the disease was often misdiagnosed as chronic nephritis. The infecting organism could usually be recovered only during an exacerbation of infection, but X-ray signs were characteristic. Irregular blunting of calyces, narrowing of calyceal necks and decrease in thickness of renal tissue were the cardinal signs. Treatment was unsatisfactory, but prevention was feasible only by following up and eliminating the organism completely in all cases of urinary tract infection. *Bacterium coli* and *Streptococcus fæcalis* might infect an apparently normal urinary tract, but *Pseudomonas pyocyanea* and *Proteus vulgaris* infections usually indicated some abnormality and persistent infection, while a staphylococcus often indicated the presence of a stone. Dr. Bonnin went on to say that in practice drugs fell into two groups. Sulphonamides and mandelamine might be used empirically, and in sick patients so might chloramphenicol. The other antibiotics and "Furadantin" should be used only after cultural sensitivity tests had been carried out. Patients with acute or subacute infection fell into two groups: those with local symptoms only and those with general toxæmia. Fever and toxæmia meant tissue infection, and such patients should be treated at once with the same order of dosage of a sulphonamide or of chloramphenicol as would be used for a patient with pneumonia. The effectiveness of alkalinization of the urine should not be forgotten. In patients without fever infection might be presumed to be within the urinary collecting organs, and concentration of a drug by the kidney made a small dose of a sulphonamide as effective as a large dose. After subsidence of the acute attack, a small dose of a sulphonamide or mandelamine should always be given for two to three weeks to eliminate the infection finally.

Dr. Bonnin said that follow-up examination and microscopic examination of the urine some three to four weeks and again three to six months after the attack were most essential. As a rule of thumb, full urinary tract investigation was indicated after the failure of two courses of treatment in the female; but in the male a single attack of urinary tract infection was a reasonable indication for investigation. In the male urine for culture should be a midstream specimen. In the female a catheter specimen was required. In female children a midstream specimen was often satisfactory. Intravenous pyelography should always include a film of the bladder after micturition and preferably one film of the kidneys taken during inspiration. Retrograde pyelography should be performed only when indicated by an intravenous pyelogram. In the female recurrent infection without discoverable cause might be treated by a six-months course of a sulphonamide, such as "Urolucosil", with attention to general health. In the male prostatitis was best treated by recovery of the organism in the first urine passed after prostatic massage and administration of the appropriate antibiotic with prostatic massage during therapy with the drug. In many cases of old, long-standing, mild, chronic infection, the organism was doing little harm, and the condition was quite comparable to mild chronic nasal sinusitis. The patient's illness was often due to a neurosis, and reassurance rather than prostatic massage was indicated.

T. GIBLIN (Tasmania), in opening the discussion, said that in a consideration of a general subject like urinary tract infections it was apparent that all the aspects could not be fully covered, and discussion must be limited to certain points. Under Dr. Bonnin's scheme of management with which he generally agreed, it was obvious that all patients whose infection did not rapidly clear and stay cleared were submitted to a full urological (and, if women, gynæcological) investigation. Many, indeed, would have that carried out *ab initio* because the history or clinical signs would suggest an obvious lesion of some part of the urinary tract that would be the basis of the infection. That lesion was dealt with and the infection was cleared; it was the chronic or recurrent infection that presented the problem. In his opinion that hard core fell into one of two general categories: (i) Patients with lower urinary obstructions due to stricture or neurogenic bladder. They were mostly men, and the majority had strictures, prostatic obstruction having been readily discovered and dealt with. (ii) Patients with resistant strains of bacterial infection.

Dr. Giblin then said that he endorsed Dr. Worcester's remarks relating to infections in women. Even in the absence of any gynæcological symptoms, one not uncommonly found a minor degree of cervicitis, and when that was cleared the recurring cystitis ended. In many cases there was a combination of both groups, for the patient with a stricture and infection often came after many courses of chemotherapy and had an infection resistant to antibiotics. With such a patient he invariably carried out a sensitivity test before ordering any antibiotic, and preferably after none had been given for some weeks. The determination of the offending organism was, to him, of academic interest only, although it was generally done, for a classification gave no leads as to what was the best antibiotic to use. Under the system he used, tubes of broth containing measured amounts of urine were incubated with concentrations of each antibiotic (or combinations of antibiotics) corresponding to the anticipated blood levels of those agents with the normal course. Only an antibiotic, or combination of antibiotics, which entirely inhibited growth was given, for it was held that anything less effective would only perpetuate resistant strains. If no combination was effective, no antibiotics were given. That was a rare phenomenon, for they found that the use of either combinations (with apparent synergism) or changing of the pH (for which they could test by their method) would rarely fail. Dr. Giblin said that that method, developed by Mr. Frake (former Repatriation Commission Laboratory Technician in Hobart), had been adopted with entire satisfaction by the University of California and in certain laboratories in Chicago. Clinical

results were in complete uniformity with in-vitro tests, provided always that there was a completely clear urinary flow. The failures had been essentially those of resilient stricture in men, in which some obstruction appeared to occur shortly after dilatation. It was the treatment of those strictures that seemed to him to be the crux of the problem in those cases.

Dr. Giblin went on to say that one other type of apparently irreversible change should be mentioned—pyelonephritis occurring in children, the original infection having commenced very early in life. He could think of two or three babies who had been referred to him after pyuria had been found to be chronic; no microorganisms had been cultured over periods of many months after a course of the effective antibiotic, and after a year or so further episodes of infection had developed and been cleared, and yet the children had gone on to renal failure in their teens. Full urological investigation had shown no obvious abnormality in the excretion pyelogram except early clubbing of the calyces described by Dr. Bonnin; and yet the course had been slow but relentless except for the exacerbations at long intervals. He could only suppose that the pyelonephritis had been a very early development in those cases. Dr. Giblin finally said that reference had been made to combinations of antibiotics used as the results of their sensitivity tests. At first streptomycin with "Aureomycin" was a fairly common effective one; lately "Gantrisin" with "Achromycin", or "Furadantin" with "Achromycin" or streptomycin with "Furadantin" was tending to replace the original combinations. It was important to remember that the sensitivity changed from time to time, and it should be checked if the infection recurred.

R. F. MATTERS (South Australia) said that he considered the indwelling catheter an irritant and a cause of cystitis. He got his patients up within a day or two of operation, and encouraged the use of a commode.

F. A. BELLINGHAM (New South Wales) said that he agreed with Dr. Worcester on all points except catheterization after operation, which was always followed by cystitis. He instilled one ounce of 0·5% mercurochrome solution into the bladder at the end of the operation, and rarely was post-operative catheterization required.

J. F. CORREY (Tasmania) said that he had tried the method of mercurochrome instillation in a controlled series of cases, and had found that catheterization was generally still necessary.

F. J. BROWNE (New South Wales) said that in pregnancy about 10% of women had bacteria in their urine, found on culture. He recommended the "single drop" method of examining the urine; one drop of uncentrifuged urine was microscopically examined on a slide; the presence of pus cells and organisms indicated a diagnosis of urinary infection. Professor Browne said that he had been interested in the mention of mandelic acid, which had been first tried in his unit by Rosenheim. Professor Browne stressed the importance of following up patients with pyelitis of pregnancy by X-ray examinations. In cases in which the infection did not clear up, malformations might be found. The routine radiological examination of patients with pyelitis of pregnancy was frowned upon, and he supposed they would have to do without it.

K. L. H. KIRKLAND (New South Wales) said that at least one X-ray examination with the patient standing was necessary for the diagnosis of ptosis of the kidney and kinking of the ureter. He thought that the use of an indwelling catheter was not so dangerous as over-distension of the bladder.

F. R. FAY (Tasmania) suggested that, in the order of investigations, a cystoscopic examination should precede the intravenous pyelogram.

I. L. ROWE (Victoria) asked whether a general practitioner could be excused for treating a patient at first with sulphonamides, and then, if they were not successful, with antibiotics, without laboratory investigation if that was not readily available.

Dr. Worcester, in reply, said that he had tried leaving an indwelling catheter in position for only 24 hours. He had also tried the instillation of mercurochrome. Whenever over-distension of the bladder was repeatedly occurring, he advised the patient not to drink too much until she was passing urine freely.

Dr. Thomson, in reply, insisted that there were no organisms in normal urine. To Dr. Rowe, Dr. Thomson said that he agreed that a general practitioner must try treatment before a full laboratory investigation was carried out when the latter was not readily available. If whatever was used was not effective in 72 hours, it should be abandoned and something else tried. He believed that the future of antibiotics lay in the use of combinations of them. The reason for their efficacy when they were so given was not yet understood.

Dr. Bonnin, in reply, said that the intravenous pyelogram should be taken first and then the cystoscopic examination should be carried out, because it was possible that a retrograde pyelogram would be required as well, and that order of investigation saved a second cystoscopic examination.

SECTION OF OPHTHALMOLOGY, SECTION OF ORTHOPÆDICS AND SECTION OF PÆDIATRICS.

A COMBINED MEETING of the Section of Ophthalmology, the Section of Orthopædics and the Section of Pædiatrics was held to discuss congenital abnormalities.

Congenital Abnormalities.

J. McB. WHITE (Victoria) read a paper entitled "Congenital Abnormalities of the Eye". He said that he had taken much of the detail from Ida Mann's book on "Developmental Abnormalities of the Eye". The study of developmental abnormalities of any region of the body should have as its basis an attempt to recognize the various types and to correlate them with the various stages and processes of normal development in which they originated. Knowledge of the normal growth processes was necessary before the abnormalities were discussed.

The object was to classify, describe and assess embryologically the commoner departures from the normal in the development of the human eye. According to Professor Mann, the first six weeks of early life were the most packed with incident, since the greatest change (from the single zygote to the fœtal body) occurred during those weeks. At that time all the gross abnormalities occurred, whether of the whole fœtus or of the eye alone. Abnormalities arising once the organs were established could never be so gross. Dr. White then quoted Professor Mann's tabulation of the chronological sequence of the growth processes of the eye. The first period was the organogenetic period, in which three developments occurred. (i) The optic pit changed into the optic vesicle and the lens plate formed by the end of the fourth week. (ii) At the end of the fourth week the lens pit and vesicle appeared. The optic vesicle invaginated to form the optic cup. Pigment then appeared in the outer layer of the optic cup. (iii) At the end of the sixth week the fœtal fissure was closed. The lens separated from the surface ectoderm, and primary lens fibres formed. Retinal differentiation and likewise the *tunica vasculosa* began. The second period was the neo-fœtal period. That was the stage reached by the end of the third month, when secondary lens fibres began. The *tunica vasculosa lentis* was fully formed, the lid folds developed and the ectodermal layers of the iris began. In the fœtal period which followed, there were three developments. (i) During the fourth month the central artery of the retina, the ciliary and pupillary muscles, the sclera, the ciliary body and the outer layer of the choroid began development. Also during that period the posterior vascular capsule of the lens began to retrogress. (ii) In the seventh month the pupillary membrane retrogressed. The *pars plana* began, and also medullation of the otpic nerve.

(iii) By the ninth month the hyaloid artery had disappeared, and medullation of the optic nerve had reached the *lamina cerebrosa*. In th eneo-natal period the *macula lutea* was finally differentiated between the fourth and sixth months after birth. During the development of the eye, the lens, the epithelium of the conjunctiva, the cornea, the lachrymal gland, the epithelium of the lids and their derivatives were derived from surface ectoderm. The retina, together with the pigmentary epithelium and their forward continuations, including the sphincter and dilator of the pupil and the optic nerve, were formed from neural ectoderm. An adhesion between the surface ectoderm and neural ectoderm produced the vitreous body and the suspensary ligaments. The blood vessels, the sheaths of the optic nerve, sclera, ciliary body and muscles, the cornea less its anterior epithelium, the stroma of the iris, the walls of the orbit muscles and the lids were formed from mesoderm.

Dr. White then gave examples of what might happen in the embryo and later give rise to clinical entities. He mentioned conditions as anophthalmia, congenital aphakia, coloboma of the retina and congenital cystic eyeball associated with microphthalmus. Clefts due to non-closure of the fœtal fissure would involve the ciliary body, the iris and the non-nervous part of the retina. That non-closure of the fissure produced colobomas of the choroid, iris and lens. Clefts in the iris, which might be multiple and in any position, were probably due to errors in the mesoderm, which hindered growth of the iris. Flocculus was the condition in which there was hyperplasia of the ectoderm or pigment epithelium of the iris. When hypoplasia of the iris pigment was present the iris was translucent as in albinos. The pupils were never quite in the centre, but in corectopia the pupils were more eccentric than normal. Polycoria was an iris anomaly in which more than one pupil was present. The vascular system was formed from mesoderm, and in the eye there were two sets of vessels —hyaloid and annular. Those systems anastomosed, giving off loops which coursed over the lens. The pupillary membrane was formed from those loops, with accompanying mesoderm. Abnormalities seen in the vascular system were due mostly to failure of the vessels to disappear before birth. A persistent pupillary membrane, which was the last to disappear, might have a complete circulation, or only minute greyish threads adherent to the iris. There might be a persistent hyaloid artery, in whole or in part, or only a persistence of the lateral portion of the vascular tunic of the lens. That might hinder the development of the iris, producing one form of coloboma of the iris. If the complete circulation persisted, the condition of aniridia might be produced. When the mesoderm in the corneoscleral angles in the anterior chamber of the eye failed to atrophy, with the production of a blockage of the filtration angles, buphthalmos arose; if recognized early it could be helped by surgical measures. A common anomaly was epicanthus, in which the folds of skin at the inner canthi of the eyes, continuous with the nose, were concave towards the eye. The condition might give a false impression that a squint was present. As the nose developed, so the folds disappeared. The Meibomian glands might be replaced by an inner row of eyelashes, so that the lid had a double row of lashes. Cryptophthalmia might be present at birth, the eyelids being fused together. The lens was nearly spherical at birth and set further back in the eye. The angle of the anterior chamber was wider and the ciliary processes were smaller. Adhesions of the ciliary processes to the lens capsule might lead to total or partial dislocation of the lens, abnormal shape of the lens or abnormalities of the suspensory ligament. Opacities found in the lens might be due to failure of closure and separation of the lens vesicle from the surface ectoderm, which occurred about the fourth week in the embryo. Failure of the lens to separate from the cornea delayed growth of the iris. Failure of development of the posterior lens fibres produced a congenital disk-shaped opacity due to absence of the central lens fibres. Early intrauterine infections such as rubella caused that type of cataract.

Two abnormalities of the retina were coloboma of the macula, which might be produced by toxoplasmosis, and congenital retinal septum.

Dr. White then said that possibly one of the commonest clinical abnormalities of the eye was incomplete canalization of the naso-lachrymal duct, causing the watery eye in the newborn. The condition was often diagnosed as conjunctivitis. In many cases there was a spontaneous cure, but often the tear duct had to be probed. Referring to disorders of motility of the eyeball, Dr. White said that squint and nystagmus were the commonest seen clinically. Nystagmus was seen in any case in which vision was grossly affected in both eyes by some axial opacity of the cornea or lens or some macular defect. Retrolental fibroplasia had been thought to be a congenital abnormality, but observers believed that it had its onset during the first month of post-natal life. It involved the retina and its blood vessels. Dr. White said that some of the theories put forward as causes of congenital abnormalities were (i) the hereditary and familial factor; (ii) toxins, hormones, foodstuffs, drugs and bacteria passing through the placenta, not necessarily affecting the mother as they did the embryo; (iii) mechanical factors, such as abnormal pressure or trauma and injury involving the mother as well. Posture of the fœtus and membranes were also important factors. Abnormalities had been found in cases in which the fœtus was adherent to the placenta. Dangerous pressure on the fœtus might be exerted by the umbilical cord. Excess or deficiency of amniotic fluid might cause deformities. Deformities were unlikely to be caused by external pressure from the uterus or pelvis, or by maternal trauma. As Professor Mann had emphasized, the type of abnormality was determined by the time of action, rather than by the nature of the causative agent.

Dr. White finally said that the occurrence of congenital abnormalities could be lessened only by more extensive research into the ætiology of their causation, and their effects mitigated by more adequate treatment when they did occur. All newborn babies' eyes should be carefully examined by the attending obstetrician, so that any abnormality could receive early attention.

R. L. STEPHEN (New South Wales) read a paper entitled "Some Aspects of Congenital Deformities". He said that he proposed only to refer to some congenital abnormalities of the limbs, to deal briefly with their recognition and suggested treatment, and to consider whether or not something could be done to prevent their occurrence. The earlier treatment was commenced, the better the result to be expected; thus every newborn child should be closely examined for deformity, and it had to be borne in mind that multiple deformities were frequently found in the one child. An example was *arthrogryphosis multiplex congenita*. That condition was found more frequently in males than in females and resulted in multiple deformities, usually a flexion deformity of the joints; but deformity in any direction might occur. Typical deformities were flexion deformities of the knees, elbows and wrists, and it was a common cause of *talipes equino-varus*. Congenital dislocation of the hip was not uncommonly found in conjunction with other deformities. The digits were frequently affected, and indeed any joint might be involved. On examination of such patients, one found a springy type of resistance to movement at the affected joint, and movements were frequently severely restricted. The joints, particularly the knees, might have a spindle-shaped appearance, and at times a web was found across the flexor aspect of the joint. The condition was probably the result of *myodystrophia fœtalis deformans* with resultant secondary contractures causing bone and joint deformities. Treatment consisted of repeated manipulations and the application of plaster casts, directed to overcoming the particular deformities present. Open operation might later prove necessary. The results in general were poor.

Referring to congenital amputations, Dr. Stephen said that they might range from congenital absence of all four limbs to loss of portion of a digit. The diagnosis was obvious on inspection, and treatment was largely a matter for the artificial limb maker. An important question to be decided was when to fit the prosthesis, and that problem differed in the upper and lower limbs. The urge to walk was very strong, and in the case of loss or partial loss of a lower limb the sooner the child could be fitted with a prosthesis after it had reached walking age the better.

In the upper limb, on the other hand, the prosthesis was largely of æsthetic value. During pre-school years, in the environment of its own home, the child as a rule was not sensitive to its deformity; but on commencing school the child was apt to become very sensitive to the comments of strangers. It was therefore suggested that, in upper limbs, the prosthesis should be fitted before the child commenced school, sufficiently early for him to become accustomed to its use.

Dr. Stephen then said that constriction band deformities were evident on inspection and on palpation. They might be so slight as not to require treatment, or severe enough to necessitate amputation. In the intermediate range, plastic surgery could do a great deal. Each case must be judged individually as to the treatment indicated. Discussing congenital dislocations, Dr. Stephen said that the commonest was congenital dislocation of the hip, found much more frequently in females than in males. It was frequently first noticed by the mother, long before the child commenced to walk. Dr. Stephen mentioned some of the points to be observed in examining a child with suspected congenital dislocation of the hip and said that the diagnosis should finally be confirmed radiologically. In the very early stage, treatment by wide abduction alone was frequently sufficient. Later, treatment consisted of gradual traction in abduction, followed by manipulation and application of a plaster cast, which might later be replaced by a Denis-Browne hip abduction splint. In general, the results from conservative treatment were better than those from open reduction, although in some cases open reduction was necessary. The only other open operations which might prove necessary were a shelf operation when the acetabular roof did not grow satisfactorily, and osteotomy to compensate for anteversion of the neck of the femur. Congenital dislocations of other joints were rare. The most common was congenital dislocation of the knee, the dislocation generally being a forward dislocation of the tibia on the femur. Other congenital dislocations were dislocation of the ankle, congenital dislocation of the shoulder, which was very rare indeed, and congenital dislocation of the elbow and wrist.

Dr. Stephen went on to say that club hand might consist of either radial or ulnar deviation of the hand and was obvious on inspection. It was frequently accompanied by flexion deformities at the wrist. Synostosis of radius and ulna almost invariably occurred at the proximal ends of the bones and was recognized by the lack of pronation and supination; and with true bony fusion the diagnosis was confirmed by X-ray examination. Although the child adapted itself well to the handicap, improvement could be effected by resection of an inch or so of the radius just below the supinator insertion, with the insertion of a metal swivel into the gap and transfer of the insertion of the *flexor carpi ulnaris* into the posterolateral aspect of the radial styloid to act as a supinator. At times, in addition to the synostosis, or at other times separately from it, there was found synostosis of the humerus and radius or ulna, or both The elbow was generally fixed in extension, and the condition was recognized by the inability to obtain flexion at the elbow. Should the deformity be bilateral, it was advisable to perform supracondylar osteotomy of the humerus early, on one side, and at a later stage, when cooperation in after-care could be expected of the child, a pseudarthrosis on the other side had to be considered. Turning to syndactylism, Dr. Stephen said that the digits of either the hands or feet might be affected. In the feet, treatment was rarely called for. In the hands, however, function might be seriously affected, and in any case, parents generally desired the joined digits to be separated, even if only for the æsthetic effect. If there was bony fusion it was generally better to accept the disability; but if bony union was not present a plastic operation would separate the digits and a good result was to be expected. It was wise to defer operation until the child was four to five years old. Dr. Stephen then mentioned polydactylism, and said that not infrequently one found one or more extra digits on the hands or feet. Treatment consisted of amputation of the extra digit to gain a nearly normal appearance. In lobster-claw hand and foot there was a more or less extensive bifurcation of the member readily recognizable on inspection and due to lack of development of the middle digits, at times even including their metacarpals or metatarsals, and at times associated with polydactylism. The advisability of plastic operation depended on the degree of function in any particular case. *Talipes equino-varus* was a common foot deformity, more frequently found in males than in females, and characterized by adduction of the forefoot, inversion of the foot as a whole, and equinus with frequently a poorly developed heel. It was readily recognizable; but true *talipes equino-varus* was to be distinguished from the postural condition frequently found in newborn children. If the position could be over-corrected with only slight force, then it was postural and did not need treatment. In true *talipes equino-varus* treatment was likely to prove long and arduous. It consisted essentially of manipulation and the use of suitable retentive apparatus until the child was able to walk, and then suitable footwear. Operation, if necessary, should not be attempted until it was obvious that conservative measures had not succeeded. Dr. Stephen outlined the operative procedures to be employed. He then said that *talipes calcaneo-valgus* was the most common of the other foot deformities. It generally responded well to splinting in an equino-varus position for a month or two. There were numerous other congenital deformities and the long bones were frequently affected. The deformities ranged from complete or partial absence to minor curvatures of any of those bones. The humerus was rarely affected; but if it was, the corresponding deformity was fairly obvious and was confirmed by X-ray evidence. However, in the forearm the radius and/or ulna might be either partially or completely absent, or curved. The main effect of such abnormalities was club hand. In the lower limb there might be partial or complete absence of the femur, or shortened femur with *coxa vara*. In partial absence the defect might occur in any portion of the femur—upper, middle or lower third. It was often accompanied by absence of the patella and of the fibula, and the limb, of course, was shortened. Treatment consisted of the fitting of a prosthesis or a boot and patten in suitable cases, and later measures to equalize leg length might be considered.

Referring to the tibia and fibula, Dr. Stephen said that defects of the fibula were more common than those of the tibia, and complete absence was more common than partial absence. The foot was generally found to be in *equino-valgus*, and there were instability of the ankle, anterior bowing of the tibia, frequently with a dimple over the apex of the curve, and shortening of the leg. Treatment in the early stages was by manipulation of the foot into the neutral position, and maintenance of that position by plaster casts, and when the child was able to walk an outside iron and inside T-strap were used. Fusion of the ankle might prove advisable, and equality of leg length was accomplished by raising the shoe or the use of a patten, and later by operative measures.

In the rare cases of congenital absence of the tibia the knee was generally flexed, with the fibula dislocated upwards and outwards and the foot in varus. A prosthesis was fitted, after correction of the deformities as far as possible by a series of manipulations and plaster fixations. In a newborn child, any dimple over the tibia should be viewed with suspicion. It might indicate a congenital angulation of the tibia or even a pseudarthrosis. X-ray examination would establish the diagnosis. If a pseudarthrosis was present, the best chance of securing stability was by a McFarlane by-pass bone graft; if that failed, amputation would probably be necessary eventually. Dr. Stephen said that any of the defects of long bones in the lower limb might eventually need amputation; but that should be delayed until the child was old enough to realize the implications of the operation.

Dr. Stephen then discussed the causes of congenital deformities. He said that the factors involved were genetic and environmental. Nothing practical in the way of prevention could be done about genetic factors, so that efforts must be directed to the environmental factors. Experimental work appeared to indicate that significant factors in producing the various congenital abnormalities were a relative oxygen deficiency, maternal pelvic irradiation, faulty maternal diet (particularly a deficiency of calcium, phos-

phorus, iodine, iron and vitamins), maternal intercurrent disease or metabolic disorders, metallic poisons used to produce abortion but failing to do so, the toxæmias of pregnancy, toxoplasmosis and lesions of the placenta or uterus. No doubt there were others whose significance had not been recognized. Cortisone was under grave suspicion. However, in the development of the embryo there were certain critical periods, and the pregnant woman could be meticulously cared for from that point of view. If, as Stockard had stated, developmental abnormalities caused the death of about 23% of the human race before or shortly after the time of birth, and handicapped a proportion of the survivors throughout their lives, any effort to improve on these figures would be well worth while.

D. G. McKAY (South Australia) read a paper entitled "Neonatal Alimentary Tract Obstruction". He said that in recent years pædiatricians throughout Australia had been seeing an increasing number of congenital abnormalities, owing mainly to the rapid increase in population. He proposed to deal with a group of abnormalities causing alimentary tract obstruction. As the vast majority of affected babies was otherwise normal and their abnormality was remediable, they presented a particular challenge to the medical profession. Recent progress in anæsthesia, in association with the great advances achieved in the field of resuscitation, made surgery available to virtually all babies in that group. The improvement in surgical techniques and the better training available to the pædiatric surgeon had greatly improved the prognosis. Whilst all those aspects would continue to improve, the advances would be of little value unless the abnormalities were recognized early. As Australia's major *accoucheur* was the general practitioner, he was thus a very important member of the team sharing the responsibility for the treatment. Results proved that whenever possible the patients should be transferred to centres where special facilities existed for the treatment of the neonate. Transport, with proper equipment, should not create any particular difficulty. The insertion of a catheter into the stomach to permit of hourly aspiration during the period between diagnosis and operation would reduce to a minimum the serious inhalation risks. Whilst the classical triad of vomiting, distension and absolute constipation held good for obstruction at any age, each of those signs might require special understanding in this early period.

Dr. McKay went on to say that the majority of babies vomited in the first 36 hours. Swallowed amniotic fluid, vaginal secretion or blood might be regurgitated, but any bile staining of the vomitus was of the utmost significance. Distension was of particular importance, for tension within the bowel was likely to cause local ischæmia with the risk of early necrosis and perforation. The presence of peritonitis was at times indicated by the appearance of a small reddened area just above the umbilicus, within 18 hours of birth; such an area was an indication for urgent laparotomy. Meconium was generally passed during the first few hours of life. If there was any delay, a rectal examination with the fifth finger should be carried out. Meconium should be passed in large quantities and be dark-green in colour and of semifluid sticky consistency. On occasions the passage of a small amount of pultaceous material of varying colour had been accepted as evidence that the bowel was patent when, in fact, atresia had been present. Therefore, whilst special note must be taken of the state of the meconium, more importance should be attached to the presence of vomiting and distension as the cardinal findings in obstruction. Air entered the stomach immediately after birth, and might be found in the colon in four hours. That was an important fact, for it frequently permitted an early diagnosis to be made on a plain X-ray film. The introduction of barium as an initial step was thus unnecessary; in fact, it might prove harmful from its clogging effect or from inhalation. It should not be used except under expert supervision.

Discussing œsophageal atresia, Dr. McKay said that the presence of hydramnios should alert the obstetrician to the possibility of a defect of the swallowing mechanism in the fœtus, or to an abnormality of the intestinal tract preventing the swallowed liquor from reaching the absorptive levels. A number of cases of œsophageal atresia would be diagnosed at birth if an attempt was made to pass a catheter into the stomach of all infants born from a hydramniotic sac. Cases would not be missed by coiling up of the catheter if a firm number 10 French catheter was used. In the first few hours of life the baby might be moist and "rattly", giving the impression that the problem was primarily respiratory. Quite early it would be noticed that the baby's pillow was covered with colourless mucus, due to the swallowed saliva's filling the obstructed œsophagus and then overflowing. It might be conveniently referred to as the "salivary vomit". Further, whenever an attempt was made to feed the baby, he sucked well, but the taking of fluid gave rise to attacks of choking, dyspnœa and cyanosis. The importance of an early diagnosis could not be stressed too strongly, for the presence of lung complications from inhalation would diminish the chance of recovery. Anatomically, usually the œsophagus ended as a blind pouch in the upper or middle thoracic region. The upper end of the lower segment usually entered the trachea just above the bifurcation. It was that communication which enabled air to gain access to the alimentary tract. X-ray investigation with an opaque catheter would give confirmatory evidence. The injection of "Lipiodol" would reveal the rounded dilated end of the upper segment of the œsophagus. The "Lipiodol" should be sucked out at the conclusion of the investigation. Barium should not be used. Dr. McKay said that the treatment of œsophageal atresia was by early anastomosis of the mobilized œsophageal ends.

Dr. McKay then said that duodenal atresia in the great majority of these cases occurred below the site of the papilla of Vater; hence the vomitus would be green. That should immediately arouse suspicion and call for an X-ray examination. The presence of upper abdominal distension, perhaps with visible peristalsis, might provide added clinical evidence. There was a high incidence of mongolism associated with atresia or stenosis. The radiograph showed a large stomach and duodenum down to the site of obstruction. In atresia, no gas shadow was seen beyond the duodenum, but in the case of stenosis there was a little gas beyond. Treatment was by duodeno-jejunostomy.

Turning to malrotation with duodenal obstruction, Dr. McKay said that to enable one to understand that condition, it was necessary to state a few embryological facts. From the fifth to the tenth week of fœtal life the cœlomic cavity had a forward expansion into the base of the umbilical cord, which normally contained portion of the midgut loop. At about the tenth week the loop was withdrawn, and rotated in an anti-clockwise direction until the lower portion of the midgut, consisting of the terminal portion of the ileum, the caecum and the ascending colon lay in the left side of the abdomen. At the eleventh week the caecum and first portion of the colon were in the epigastrium and then as rotation progressed the caecum finally rested in the right lower quadrant. When rotation was complete, the ascending mesocolon and descending mesocolon fused to the back wall of the abdomen, and that anchored the base of the mesentery proper from the origin of the superior mesenteric artery obliquely downwards to the caecum. Arrest of development at the eleventh week would produce an incompletely rotated caecum with a lack of attachment of the mesentery, and thus a predisposition to a volvulus of the midgut. Associated with incomplete rotation of the caecum, bands of peritoneum were found running from the caecum to the right postero-lateral part of the abdominal wall, and in so doing they ran across the descending portion of the duodenum and obstructed it. In obstruction due to such developmental bands, symptoms might not appear for several days and then the obstruction might not be complete. In the majority of cases symptoms appeared within a week, but in others there might be no evidence for years. The advent of a superimposed volvulus might render the obstruction complete, and with the volvulus came the possibility of vascular complications. Some blood staining of the motions suggested that complication and called for urgent laparotomy. A plain X-ray film of the abdomen might reveal some dilatation of the stomach and duodenum, with a small amount of gas scattered throughout the rest of gut. In later cases, if the diagnosis could not be established, the use of a barium enema might

demonstrate the abnormal position of the caecum. It was important to make an early diagnosis, as the condition could be successfully dealt with by Ladd's procedure. The caecal tethering bands which obstructed the duodenum were divided and the caecum was allowed to take up a position in the left side of the abdomen. If a volvulus was present, it was dealt with first.

Discussing jejuno-ileal atresia, Dr. McKay said that early vomiting of bile-stained material was associated with abdominal distension. Rectal examination would reveal an undilated rectum, and on withdrawal of the finger no gas would be passed. If any meconium appeared, it would be scanty and drier than usual, and its passage would have no effect on the distension. The plain radiographs of the abdomen taken in the erect and supine positions would show fluid levels in progressively dilating loops of bowel. By way of treatment, Nixon in 1955 had suggested a modification of the Denis-Browne end-to-back anastomosis which promised an improvement in recovery rate. He resected a segment of the proximal part of the bowel, thus going well above the grossly dilated and hypertrophied terminal bulb which, according to his observations, possessed very poor propulsive ability.

Dr. McKay then said that attacks of dyspnœa and cyanosis with vomiting should suggest a diaphragmatic hernia. If there was no difficulty in swallowing, yet during or shortly after feeding there was an exacerbation of the respiratory symptoms, then an X-ray examination of the chest and abdomen should be made. The radiograph would show coils of bowel in the thorax with the mediastinal contents displaced away from the hernia, which was usually left-sided. Operation for repair of the hernia, preferably by the abdominal approach, should be carried out as an urgent procedure. The distension of the intestines with gas and possibly food might cause serious embarrassment to the baby and might considerably increase the difficulties of the surgeon.

Referring to meconium ileus, Dr. McKay said that it was the earliest manifestation of fibrocystic disease of the pancreas or mucoviscidosis. The disease was genetically determined, and affected the organs throughout the body where mucus was produced, the alimentary and respiratory systems being most affected. The meconium became excessively viscid and failed to undergo the normal passage through the small intestine. That gave rise to early abdominal distension with the vomiting of bile-stained material and failure of passage of the meconium. Some friable opaque white mucoid material might be passed, or a plug of the same substance might be felt on rectal examination. Palpation might reveal firm masses in the abdomen, and that fact, with suggestive radiographic findings, might enable a correct diagnosis to be made. The typical radiographic picture was one of low small-bowel obstruction with considerable variation in size of the coils. The distal ileal loop might be enormously distended and the site of a volvulus. Fluid levels were relatively few, but there might be a bubbly gaseous appearance with areas showing the typical mottled or granular appearance. Areas of calcification might be present, indicating intrauterine meconium peritonitis. The treatment was not standardized, but considerable improvement in results had followed resection of the greatly distended distal loop of ileum followed by the Mikulicz technique or with primary anastomosis.

Discussing Hirschsprung's disease, Dr. McKay said that approximately 90% of patients were males, and the signs of obstruction appeared more slowly than in atresia or meconium ileus. As the obstruction was a low type, it frequently took two or three days to manifest itself. There was delay in the passage of meconium, and on rectal examination the rectum was empty, whilst high up the narrower recto-sigmoid area might be felt. In the typical case of Hirschsprung's disease, the withdrawal of the finger was followed by the passage of enough gas and meconium to reduce the degree of distension. If plain radiography revealed dilated large bowel, the condition strongly suggested Hirschsprung's disease, the most likely cause of chronic obstruction at that age. The typical barium enema findings might not be obtained for some weeks.

In many cases the condition could be controlled by the regular passage before feeds of the finger or flatus tube. In others it was necessary to administer a daily saline bowel washout. If that failed, then a colostomy or ileostomy was necessary. That routine would enable the baby to thrive, so that a planned operation for sesection of the aganglionic segment might be possible from six weeks onwards.

Discussing finally infection, Dr. McKay said that there was the possibility that neonatal infection might simulate intestinal obstruction. The umbilicus might be clean and no other focus of infection might be evident. The absence of fever did not rule out an infective basis for the clinical picture. The vomiting and distension might not be so marked as in true obstruction, and in such cases the radiograph would often prove helpful. The picture would be one of generalized distension, with equal distribution throughout the small and large intestine, but lacking the progressive dilatation from loop to loop characteristic of true obstruction. In the absence of evidence of the organism concerned and its sensitivity, the antibiotic known to have the widest cover for the current local nursery infection should be used.

Dr. McKay, in conclusion, again stressed the great importance of early diagnosis in cases of neonatal obstruction. The vomiting of green material in the nursery called for immediate and careful review of the baby.

A. MURRAY CLARKE (Victoria), in opening the discussion, said that congenital deformities were of tremendous interest to pædiatric surgeons, as from them most of their surgical work was derived. In premature babies in particular, abnormalities of the alimentary tract resulted in practically all emergency surgery. It was strange, therefore, that so little was known of the ætiology and mechanism of congenital abnormalities. It was only in recent years that attempts to classify congenital deformities had been made, and he knew of no text-book adequately treating of them. A study of the subject necessitated search of papers scattered through medical literature and a good deal of experience was necessary to sift the wheat from the chaff, as much of it was fanciful and speculative He believed that one reason for the hiatus in knowledge was that too often the non-urgent conditions were dealt with by specialists at a later date with no interest in or knowledge of obstetrics or pædiatrics. For example, the eye specialist, expert though he might be, might have no contact with the maternity hospital, and many orthopædic problems were dealt with by those who had no knowledge of the conditions, mechanical or otherwise, affecting the baby during gestation and during labour. Again, in the treatment there was a great difference between the malleable tissue and the growing bone of the child and the fixed, rigid structures of the adult. In fact, although many worked in both fields, pædiatric orthopædics and adult orthopædics were almost two different sciences. They were as different as the work of the potter and that of the stone mason. In the past, the obstetrician had been solely interested in bringing the baby into the world, and not so much in the state of the baby. The orthopædist had been interested solely in correcting the deformity. The connecting link was the pædiatrician, who was now awakening to the need of a closer study of the causes of deformity. T. H. Ingalls, writing on preventive pædiatrics in 1953, had said that facts assembled by two centuries of observation and scientific study indicated that acquired malformations were for the most part preventible, but Dr. Clarke said that he would venture to say that in Australia, at any rate, most of the malformations were not prevented for various reasons which others more qualified would probably bring out in subsequent discussion. They were seeing a lot more congenital abnormalities, particularly in New Australians, which were not simply accounted for by the increase in population. For that there was a genetic explanation. Dr. Clarke said that in this there was a field of study left so untouched in the past that there must be great rewards awaiting investigators. There were, of course, great difficulties in study, because investigators were often denied the use of experimental methods, as experimental changes altering intrauterine conditions might bring the

pregnancy to an end. In saying that he was not forgetting the experimental work of Duraswami on the effect of insulin on the developing egg, or that of Warkany in inducing cleft palate in rats by riboflavin deficiency. Dr. Clarke went on to say that Dr. McBride White had included in his paper the statement that congenital abnormalities resulted from genetic, toxic and mechanical factors. Dr. Clarke believed that Dr. McBride White was correct, and that any one of the factors might produce deformities which resembled those from the other factors. However, he would point out that orthopædic textbooks (because, he believed, orthopædists were not usually in close contact with pædiatricians) were, to quote Denis Browne, committed to a dogmatic denial that ı thological conditions of the feet and joints could have mechanical causes. To admit that in the new-born there were normal variations from the adult state of obvious mechanical origin would be to allow the entry of the thin end of a heretical wedge-shaped idea. However, if one saw and handled a new-born baby and folded it up into the smallest possible space, as it might be *in utero*, one would be convinced that sometimes, at any rate, a mechanical factor was responsible for deformities including the most severe and intractable. The existence of mutual deformities in which the convexity of one talipes fitted into the convexity of another pointed to that. The frequent association of valgoid talipes with congenital dislocation of the hip could probably be explained on a mechanical basis. Whether or not that was so, the importance of valgoid talipes lay in its drawing attention to the presence of an unsuspected congenital dislocation of the hip. Dr. Clarke said that the practical importance of the papers presented lay in the plea of each speaker for early diagnosis and early treatment. In talipes that was important, as the most successful cases were those in which treatment was carried out with a strong hand and a hard heart in the first few weeks of life, and not from the age of six weeks onwards, as was often the case, it also being remembered that the position one wanted to achieve for the foot was the normal one, which in the new-born meant the dorsum of the foot lying beside the outer portion of the leg. However, in neonatal alimentary tract obstruction early diagnosis was of paramount importance. Too often the surgeon was presented with a hopeless case because of delay and consequent over-distension of gut, which had lost its propulsive activity or was, in fact, non-viable. Early diagnosis presupposed early recognition. Too often the condition was not even suspected. Dr. Clarke emphasized the fact that if every neonate with persistent bile-stained vomiting was regarded as suffering from an obstruction until proven otherwise, not so many diagnoses would be missed. Early X-ray examination was essential. Dr. Clarke said that he would go further than Dr. McKay and say that he would like an X-ray examination before fluid levels were present. There was difficulty in the very high obstruction if the patient had vomited just before X-ray examination, but that could be overcome by injecting air into the stomach as a contrast medium. Dr. Clarke said that the matter under discussion was an exciting field of neonatal surgery because with better treatment the mortality, which had been very high indeed, was falling in Australia and would continue to fall. For success one required a high degree of teamwork—in diagnosis between the general practitioner and the pædiatrician, in treatment between the anæsthetist, who could do miracles nowadays, the physician, to whom one could hand over the fluid and electrolyte therapy ("not too much" was the maxim) and the surgeon, who must know what to do for each particular type of obstruction.

KATE CAMPBELL (Victoria) said that one of the speakers had mentioned the higher incidence of congenital abnormalities in New Australians. It was thought that that might have a nutritional basis. In a new country they might not be able to obtain their usual diet, and tended therefore to live on a high carbohydrate diet, low in protein and vitamin content.

F. ARDEN (Queensland) said that he had been glad to see the emphasis being put upon early diagnosis of the conditions under discussion. It was essential that the nursing staff of the hospitals who saw those babies be trained to report the following three abnormalities at once: (i) failure to pass meconium within the first 12 hours of birth; (ii) vomiting of bile-stained material at any time after birth; (ii) a "mucousy" appearance. Such babies in particular should not be fed. Dr. Arden suggested that all babies suspected of having congenital bowel obstruction should have a rectal catheter passed. It should be a fairly firm catheter and well lubricated, and should be passed as high as possible, perhaps 10 inches or so. If on its withdrawal no meconium was found in the eye of the catheter, bowel obstruction was certain. On the other hand, such a simple operation sometimes broke down a plug of mucus, and the withdrawal of the catheter was followed by the passage of a quantity of meconium with relief of the condition. Dr. Arden asked Dr. McKay for his views as to the best position in which to keep a baby during the waiting period before an operation for œsophageal atresia. The head-low position tended to reduce the risk of the baby's inhaling its own saliva. On the other hand, it might facilitate regurgitation of gastric contents into the trachea through the œsophago-tracheal fistula which usually existed.

N. A. A. MYERS (Victoria) said that it was most important to determine carefully the sex of the newborn baby by inspection of the external genitalia, and if there was an apparent hypospadias other tests might be required, as the appearance could be misleading. Dr. Myers asked whether Dr. McKay had seen sclerema simulating intestinal obstruction in newborn infants.

KATE CAMPBELL (Victoria) referred to œsophageal atresia, and agreed that a catheter should be passed into the œsophagus of all babies whose mothers had suffered from hydramnios, as it was not always easy to be certain whether a catheter had in fact passed into the stomach or had simply curled up in an œsophageal pouch. She suggested that a little of the contents be aspirated, and if the material was found to be acid, then the tip of the catheter must be in the stomach. Dr. Campbell asked whether Dr. McKay, in his reference to infection simulating bowel obstruction, meant general infection or peritoneal infection. Referring to the condition described as neuromuscular dyskinesia or paralytic ileus, Dr. Campbell asked whether any of the speakers could give her help in the diagnosis. She also said that she had noticed increased numbers of malformations in children of New Australians, and attributed that observation to the fact that, not being able to get their own diet easily in a new country, some New Australian mothers might be having nutritionally inadequate diets, of high carbohydrate and low protein and vitamin content.

J. BRUCE HAMILTON (Tasmania) expressed his interest in the relationship between diet and congenital abnormalities and inquired how it was possible to feed immigrants on their natural diets. Dr. Hamilton further asked whether Australians themselves had adequate diets, and said that he had very grave doubts. From questions put to some of his patients, he considered that their diets were often appallingly bad.

Dr. McKay, in reply, said that he preferred to keep babies with œsophageal atresia waiting for operation in the head-low position. He had not been troubled by sclerema as a diagnostic factor. The infection that might simulate bowel obstruction was generalized infection accompanied by abdominal distension.

Dr. Stephen, in reply to Dr. Murray Clarke, said that he considered that mechanical pressure was a very rare cause of congenital abnormalities in children, because a child kicked freely *in utero* and very seldom showed pressure effects on the skin. He had noticed also that deformities such as congenital dislocation of the hips tended to occur in families, and that had led him to the belief that even the so-called postural defects of the feet were in many cases probably genetic.

DR. LAURENCE HUGHES, from the chair, thanked the speakers for their papers, and said that he was pleased to see the stress being placed on early diagnosis and the inclusion of the general practitioner as a member of the diagnostic team.

SECTION OF ORTHOPÆDICS AND SECTION OF REHABILITATION AND PHYSICAL MEDICINE.

A COMBINED MEETING of the Section of Orthopædics and the Section of Rehabilitation and Physical Medicine was held to discuss (*a*) pain in the arm, and (*b*) the treatment of slipped upper femoral epiphyses.

Pain in the Arm.

S. F. REID (Victoria) read a paper entitled "Pain in the Arm". He said that the paper dealt with chronic pain in the upper extremity which might lead to confusion in diagnosis. Disorders common to the skeletal system elsewhere—chronic bone abscess, bone tumour, trauma, etc., and those of systemic distribution, such as *tabes dorsalis*—were not included. Cardio-thoracic diseases with referred pain to the extremity (diaphragmatic pleurisy and cardiac pain) were mentioned for exclusion. Dr. Reid then briefly reviewed the diagnosis (and treatment) of local skeletal lesions with radiating pain. He said that nocturnal pain at the deltoid insertion might be a confusing symptom of the tendon cuff syndrome. Lateral (and medial) epicondylitis might be overlooked because of the radiating pain on the lateral side of the forearm. Stenosing tenovaginitis of the *abductor pollicis longus* tendon (De Quervain's disease), which was not characterized by snapping pain on movement, might underlie pain on the radial side of the wrist, forearm and hand. In all the conditions mentioned, the pain on movement, the local tenderness and, in the case of the last two, the local small tumour were diagnostic. Primary Raynaud's disease or cold-induced colour changes with pain but no vascular occlusion occurred only in young women. At other ages and in males it was almost invariably associated with vascular occlusive disease and seldom with abnormalities at the thoracic outlet. For treatment the underlying vascular pathological state must be clarified. Diffuse systemic sclerosis (scleroderma) was likely to be overlooked as were the other medial coat vascular diseases. Spinal disease with manifestations was usually a reasonably clear-cut syndrome with dermatome pain, paræsthesia or, rarely, typical root nerve palsy. It might be associated with and perhaps explain the stiff shoulder of the "shoulder-hand syndrome". Peripheral nerve lesions, e.g. ulnar nerve neuritis at the medial epicondylar groove, fitted an anatomical pattern and was usually easily recognized. It was not necessarily associated with previous fracture and *cubitus valgus* at the elbow and might, in that case, be bilateral. Compression of the median nerve at the carpal tunnel had probably long been confused with abnormalities at the thoracic outlet. The clinical features were discussed. Cervical ribs were a not uncommon radiological finding. Symptoms in the upper extremity should not be attributed to cervical rib unless other, even double, pathology was excluded, and there was a combination of postural vascular (not vasomotor) and neurological (lowest root—the first thoracic) features. Pre-axial or radial neurological phenomena were most unlikely to be due to cervical rib. Bony abnormality, however, might make costo-clavicular vascular obstruction more likely—particularly intermittent venous obstruction and axillary vein thrombosis. That probably occurred from osseo-muscular compression in the costo-clavicular wedge. Operation for symptoms believed due to abnormal thoracic outlet should be exploration. Scalenotomy was seldom sufficient. Removal of the muscular factor (scalenes or subclavius) or the bony factor (cervical rib, first rib or sometimes the clavicle) might be required. Cervico-dorsal ganglionectomy should be combined with the above if vasomotor phenomena were pronounced. The frozen hand syndrome—post-traumatic sympathetic dystrophy, Sudek's atrophy—was probably not related to disturbances of sympathetic innervation in the limb, nor, in the author's experience, was it relieved by cervico-dorsal sympathectomy. The contribution of abnormalities at the thoracic outlet to the varying combinations of neurological, vascular and vasomotor lesions in the upper limb were, nevertheless, not clearly understood. It had probably been much overestimated in the past as a factor in the vasomotor and neurological disturbances, and considerably under-estimated in the vascular occlusions, particularly the venous, postural and thrombotic.

W. LAW (Tasmania) said that pain associated with stiff shoulder was often cured by neck traction, but the stiffness remained. Stellate ganglion block was also useful for the relief of pain. In the treatment of epicondylitis hydrocortisone was good, but the muscle origin must be ploughed up with a wide bore needle and a cock-up splint must be applied to the wrist for a few days. In the carpal tunnel syndrome, surgery produced good results.

Slipped Upper Femoral Epiphysis.

IAN G. MCPHEE (Queensland) read a paper entitled "The Treatment of Slipped Upper Femoral Epiphyses", based on his experience of 32 cases at the Brisbane Hospital during the period 1950-1955. The children were all aged over 12 years. Discussing first the group of cases in which deformity was minimal, Dr. McPhee said that such cases were often missed unless a lateral X-ray film was taken. That was a tragedy. He was not in favour of conservative treatment; such patients were best treated by internal fixation, with three 2·5 millimetre pins. That method had proved entirely satisfactory, although it would be many years before the final result could be assessed. Dr. McPhee then discussed cases in which slipping was more pronounced, but there was no evidence of new bone formation. He said that in some such cases reduction could be effected by traction or very gentle manipulation, after which internal fixation could be performed. In cases in which deformity was severe, there was usually also evidence of new bone formation, and it was impossible to effect reduction. In most cases the deformity could be corrected by an intertrochanteric osteotomy. There was always the risk of aseptic necrosis of the head of the femur, so that sometimes it was best to accept a safer but partly uncorrected position rather than run that risk. There were a few cases in which the neck was so far in front of the head that, unless the correction was in the region of the slip, there was no hope of obtaining a reasonable correction. Such hips were doomed to early osteoarthritic changes unless they could be improved. Subcapital osteotomy seemed to be justified in such cases, despite the risk of aseptic necrosis.

THOMAS KING (Victoria) said that he used conservative treatment when the slip was minimal. He applied a walking caliper for twelve months. Intertrochanteric osteotomy was used in all other cases.

EMMETT SPRING (Victoria) said that he had tried the application of a plaster spica in an acute case with a bad result.

SECTION OF OTO-RHINO-LARYNGOLOGY AND SECTION OF PÆDIATRICS.

Allergies of the Respiratory Tract in Childhood.

A COMBINED MEETING of the Section of Oto-Rhino-Laryngology and the Section of Pædiatrics was held to discuss allergies of the respiratory tract in childhood.

V. BULTEAU (New South Wales) read a paper entitled "Allergies of the Respiratory Tract in Childhood". He said that the fundamental problems of allergy had not yet been solved. Respiratory allergy was regarded by many authorities at present as the localized end result of faulty enzymatic proteolysis in the entire body, rather than as an antigen-antibody reaction. Until they had learnt to correct that fault, which was often hereditary, the best results came from control of the allergenic factors concerned. Positive action should be taken to protect the potentially allergic child from massive invasions of inhaled or ingested allergens at crucial times—for example, *in utero*, during weaning, illnesses, operations or convalescence, and in its habits by day and night. The child with chronic or recurring respiratory symptoms should have a full allergy history taken. A *questionnaire* for the parents and summary sheet gave valuable information. The findings in the nose and chest, cytological examination

of nasal and bronchial smears for eosinophils, X-ray examinations, skin tests and repeated observation of the patient in doubtful cases would then complete the diagnosis.

Dr. Bulteau went on to say that the home was the important place in treatment, and parental cooperation was essential. The preservation of good physical and mental health and elimination of the factors revealed by the history or tests were the most effective measures, but they must be thorough. Symptomatic treatment, such as the use of ephedrine, antihistamines, corticosteroids and nose drops gave good relief, but the final results were disappointing. Hyposensitization by the sublingual method was convenient for children, while non-specific courses of injections helped to build some resistance. Surgical measures, such as adenoidectomy and procedures on the septum and turbinates, helped by providing better mechanical conditions, but no more. Statistics showed that cures were rarely to be expected, but those who received early help responded better and lost less schooling.

P. C. P. WAUGH (New South Wales) read a paper entitled "Allergies of the Respiratory Tract in Childhood". He said that allergy was faulty production of antibodies, with their fixation in shock tissues. Assault by antigens produced clinical manifestations. Allergy acted in two ways. The first was as a pure cause of respiratory disability, which was easily recognizable as hay-fever or asthma, but less easily as perennial rhinitis. There were many pointers to assist in the recognition. The second method was by preparing the soil for infection, and the third, by complicating infection. Many features indicated the existence of hypersensitivity to coryzal organisms. Dr. Waugh went on to say that the results of skin tests must be evaluated in the light of the clinical history, and incriminated antigens submitted to a "Koch's postulates" type of trial. He mentioned intradermal testing for bacterial hypersensitivity, and discussed the circumstances in which it was of value. Referring to desensitization, Dr. Waugh said that it was of value (i) in pure pollenosis, (ii) with house dust when "Koch's postulates" had been tried and adequate preparation of extract was possible, and (iii) with vaccine, if the history and the results of skin tests indicated that the patient was suitable for such treatment. Desensitization by injection was of no value with foods. The treatment of allergic children required the removal of as many straws as possible from the camel's back.

S. E. L. STENING (New South Wales) read a paper entitled "Allergies of the Respiratory Tract in Childhood". He said that the clinical manifestations were rhinitis, seasonal hay-fever, croup, bronchitis, bronchiolitis, pneumonitis and asthma. The great characteristics of allergic disorders was the tendency to recurrence. An analysis of 100 consecutive clinical histories of children with respiratory allergy showed that 50 had asthma, 32 allergic bronchitis, 13 rhinitis, two seasonal hay-fever and three croup; coincidental cutaneous allergies were present in 23 cases. The causative factors elicited were emotional or psychogenic in 62 cases, climatic in 14, physical in six and inhalant in 15; pollen was incriminated in three cases, food in 13 and infective factors in 20. An analysis of the emotional factors had given the following findings: the home was involved in 24 cases, the school in 13, "moving house" in 12, separation in six, accident in two, operation in nine; miscellaneous factors (Christmas parties, birthdays) were the cause in six cases. The results of skin tests were positive in 53 cases, negative in 17; in 30 cases no skin tests were carried out. In 25 cases positive results to skin tests were considered relevant. Of the children who gave skin reactions, 42 reacted to the inhalant group of allergens, 11 to the pollen group, 29 to various foods and four to bacterial antigens. Tonsillectomy had relieved the existing allergic state in two cases, made it worse in six, initiated it in three and had no effect in 10.

R. H. O. DONALD (Victoria) in opening the discussion, said that there could be no doubt that heredity played a major role in allergic conditions, and children with a family history of atopy should be shielded as far as possible from the most common substances causing allergic manifestations. Once a child showed any allergic state, the parents should be instructed to keep him away from any allergenic substances. They must make every endeavour to avoid contact with pollens, particularly the pollens from the spring, summer and autumn grasses. House dust, flock, kapok and feathers should be avoided, and also some of the soft furry toys with which children played; pets, such as dogs, cats, rabbits, horses and birds, should be kept away from all allergic children. That avoidance of allergens should be continued until it was definitely proved that contact with those substances had no relation to the child's allergic condition. Prompt and thorough allergic investigation and treatment should be carried out if the child had infantile eczema, frequent bronchitis or hay-fever or if rhinitis or wheezing occurred. Food allergy was not very common, but one should be on the lookout always for one or more foods as causative factors. Dr. Donald agreed with Dr. Waugh that the results of skin testing for foods were not very satisfactory; but sometimes a clue could be obtained by careful skin testing for individual foods, and any seemingly positive reactions obtained could then be tested by a clinical trial of the particular food. Elimination diets were a much more satisfactory method of ascertaining food sensitivities; but even those might be difficult in the investigation of young children. Every effort should be made to give those children a clear nasal airway. With recurrent attacks of allergic disease, the turbinates were apt to become chronically swollen, the ostia of the accessory nasal sinuses obstructed and the cilia overloaded. Secondary infection would frequently occur, and then the child had not only an allergic condition to contend with, but infection as well. Wise and careful investigation and management would frequently avoid the occurrence of a high degree of chronicity. A careful history and physical examination would often indicate how best to tackle the particular problem. Skin testing should then be carried out, by a properly trained allergist or under his direct supervision. Skin testing should never be a laboratory procedure by a pathologist or a technician, who had not the training or knowledge to weigh up all the evidence and then plan a proper course of treatment for and management of the patient. Skin testing must be thorough and extensive, and carried out with fresh individual substances; group testing was thoroughly bad. When a child was found to be allergic and to give strongly positive skin reactions to a number of allergens, avoidance was the best line of treatment; but when that was impossible, desensitization with properly prepared extracts, if correctly planned by a well-trained allergist, would nearly always give beneficial results. A big mistake was to try to include too many substances in the mixture, which consequently lost much of its potency by dilution.

Dr. Donald then said that when secondary infection had occurred, that would sometimes clear up if the allergic condition was controlled; but if it did not, antral washouts and the administration of antibiotics would frequently control the infection, and if any polypi were present they could be removed. If tonsils and adenoids were a source of infection or obstruction, they should be removed; but the parents should be told beforehand that that procedure would have little or no beneficial effect on the allergic condition. In his opinion, major surgical procedures on the nose or nasal sinuses of allergic children should be avoided, partly on account of the fact that development of the nose and sinuses was not yet complete. That especially applied to children who had nasal polypi and asthma and were aspirin sensitive. Severe and chronic asthma and even death could occur in such patients when subjected to sinus surgery.

Dr. Donald went on to say that so-called bacterial allergy, to his mind, was a very real thing. Affected children become sensitized to their own organisms or the products of those organisms. Often there was very little purulent discharge in the nose, sinuses or bronchi, and yet the children had many attacks of nasal obstruction and allergic bronchitis. They were best treated by very small hyposensitizing doses of bacterial vaccine, autogenous or stock, such as a coryza vaccine. He had a number of severely asthmatic children who were controlled by that method. Bronchial asthma was a frequent and severe

manifestation in allergic children; but if the allergic and/or infective conditions were properly controlled in the upper part of the respiratory tract, it was found that the asthma could be brought under control more easily in many cases.

Dr. Donald finally said that it should be remembered that once a person was allergic he would always be allergic. The symptoms might be controlled or "grown out of" for many years; but if he came into contact with a sufficiently high concentration of allergen to which he had been sensitized previously, his symptoms of allergy would surely return.

R. SOUTHBY (Victoria) said that he had been interested to hear the importance placed on skin testing by the speakers. He agreed with Dr. Stening that children suffering apparently from bronchitis, whose rises in temperature lasted only 24 hours, probably had an allergic disease. X-ray examination of the chest often confirmed that, showing shadows one day and a clear chest picture the next. He asked at what age one should start skin testing affected children and how many tests should be made at one time. He vividly remembered attending an overseas clinic where a child was to be tested, and seeing a sister bring in a tray containing 96 syringes. The registrar had held the child in a sort of headlock, while a second victim was held by another registrar and saw all that was going on. Dr. Southby was certain that the psychological damage far exceeded the benefit of the testing. He said that he himself exercised great care in how he warned mothers about allergy in their children, lest they should become too distressed and make the condition worse.

G. WRIGHT (Queensland) said that Dr. Waugh had crystallized his own conclusions on the subject as met with in general practice. He had always believed that infections accompanied allergy, and thought that doctors often did not clean them up adequately after the child had been ill. He believed that four components—heredity, emotional factors, allergy and infection—were always present in all cases of asthma. Dr. Wright said that in Queensland, with six months' freedom from winter infections, there was a better chance of controlling those conditions in children. He found that if three years' good health and adequate control of chest infections could be provided, there was every chance that the child would throw off his asthma. He attached importance to dust control in the home, and found that the best way of achieving it was by oiling the bedding. He himself used equal parts of liquid paraffin and white spirit applied as a spray to the blankets, and said that he obtained good effects from that method.

KATE CAMPBELL (Victoria) said that in allergic families when the infant showed an allergy to milk it was common to find that the mother had all her life taken very little milk or cheese. During her pregnancy she increased her intake of milk, eggs and cheese very largely. Such an infant often presented with eczema, less frequently with respiratory tract allergy, which cleared on withdrawal of cow's milk. In such families it was wise to guard against sudden increased intake in the diet of the mother and to institute a gradual increase.

R. W. GREVILLE (Victoria) said that he sometimes doubted the reliability of intradermal skin tests. He had often noticed that normal adults gave positive reactions to various substances, but had no other manifestations. He himself found that subcutaneous skin tests were very much more affirmative.

F. ARDEN (Queensland) said that he doubted whether food allergy played very much part in respiratory tract disorders in children. He was concerned with asthma sufferers unfortunate enough to be submitted to a large series of skin tests against common foodstuffs. They reacted positively to perhaps 30% of the tests, after which all those articles were excluded from their diet. He thought that skin-testing for foods had no place in the management of the average asthmatic child.

DR. GRAY (Victoria) said that nose and throat surgeons saw three kinds of noses in allergic children. In the first kind, the nasal mucosa was shiny and wet and pink, and there was a good airway. In the second kind, the mucosa was a little swollen and bluish. In the third kind, there was the classical pale, allergic mucosa with complete obstruction. The first kind of condition was readily treatable. The second kind was also reversible by treatment, but tended to relapse with intermittent obstruction, and eventually cauterization of the turbinates was required; by that means normal nose breathing and evaporation could be produced. The third kind of condition was irreversible; there was no response to nasal drops, and surgery was required, together with suitable anti-allergic treatment. Dr. Gray quoted the case of one such child on whom submucous resection of the turbinates was performed with the production of a good airway, and for a time normal mucosa reappeared. However, two years later the child's condition was just as bad as before.

M. R. JOSEPH (New South Wales) said that it was often a difficult mechanical problem to produce a satisfactory nasal airway. There was a valid argument against the use of decongestants—the damage that frequently occurred from too constant use. However, surgical procedures could lead to improvement. Dr. Joseph asked for Dr. Bulteau's views on high frequation treatment, which shrank the nasal mucosa without damaging the cilia. Dr. Joseph agreed that bronchoscopy was always harmful in allergic bronchitis.

F. L. LONG (New South Wales) asked what Dr. Stening would do with the infant with the constantly blocked nose.

J. H. COLEBATCH (Victoria) said that he thought the discussion had been too much on the aspects of allergy, and that not enough consideration had been given to the factors of infection and psychological stress. He agreed with Dr. Wright that all those factors should be taken into account when the patient was under consideration. He made a plea first for postural drainage for all patients with allergic bronchitis, because many of them had incipient bronchiectasis or lung infection, and secondly, for the sending of selected patients to a good psychiatrist.

J. D. MATTHEWS (New Zealand) asked whether there was any place for ionization or cauterization of the turbinates in children. He also asked whether there was any place for the use of "Hapamine". Dr. Matthews went on to say that he hoped that Dr. Bulteau, when he used the word "parentectomy", did not mean that all children suffering from asthma should be sent immediately to boarding-school.

Dr. Waugh, in reply, said that he would like to give his audience the concept of a theshold for allergic disorders comprising 70% pure allergy and 30% psychological factors. Additions to either of those increased the total threshold level and might produce an attack of asthma. For example, a housewife allergic to dust might yet manage quite satisfactorily until an emotional upset increased her threshold level and produced an attack of asthma. "Hapamine", in his experience, was of no value and he did not use it. He also agreed that multiple intradermal tests for food allergy were barbarous and should have been abandoned years before.

Dr. Stening, in reply, said that he did use skin tests, but only as adjuncts to investigation. He gave them to babies under the age of six months, less often during the teething period, and then again after the age of two years. He never tested more than eight substances at one time. With foodstuffs he mainly tested for milk and egg sensitivity. He had reason to remember that foodstuffs could occasionally be responsible for asthma. One child whom he had treated not very successfully for some time was finally taken off milk altogether by his parents at the suggestion of the local butcher, with immediate improvement. Dr. Stening said that the humiliation he suffered from that event had impressed it on his memory. He treated small infants with blocked noses with drops of 0·5% ephedrine in saline, putting one drop in each nostril before each feed. In addition he gave "Benadryl", one milligramme per pound of body weight per day in divided doses if that was necessary. He was not altogether happy about seeking psychiatric assistance; it could do damage, unless the psychiatrist was really good.

Dr. Bulteau, in reply, said that X-ray findings in the lungs paralleled those in the sinuses; both might change overnight. After all, both reflected changes of similar nature in the same type of respiratory mucosa. By way of protecting small children from unnecessary allergens, he tried to get mothers to adopt the simple regime of having the nursery as unadorned and monastic as possible. He agreed entirely with the points made by Dr. Gray about the different types of allergic noses met with in childhood and with his treatment for the various types, except that he himself found submucous resection of the turbinate bones a difficult operation in children because of lack of space, and he generally did not perform it on children under the age of eight years. He preferred linear cauterization of the turbinates. Even so, that often gave only temporary relief. He had no personal experience of the high frequator, but thought that it probably gave the same end result as cauterization. Generally speaking, nose drops were anathema to him. Like other nose and throat surgeons, he saw children and adults who had used them far too frequently developing as a result complete stasis in the nose. When that happened, the best treatment was to give ephedrine by mouth and take the patient completely off all nose drops. He had no great belief in nasal ionization, and thought it no better than cauterization. By his term parentectomy, he had intended separating the child from too great a degree of protection at home, and allowing him to take part in the ordinary activities of school life.

Dr. Hughes, from the chair, thanked the speakers, and in concluding the discussion stressed the value of breathing exercises, of which he himself had always been a great advocate.

SECTION OF OTO-RHINO-LARYNGOLOGY AND SECTION OF PUBLIC HEALTH, INDUSTRIAL MEDICINE AND HOSPITAL ADMINISTRATION.

The Problem of Noise in Industry.

A COMBINED MEETING of the Section of Oto-Rhino-Laryngology and the Section of Public Health, Industrial Medicine and Hospital Administration was held to discuss the problem of noise in industry.

R. N. REILLY (South Australia) read a paper entitled "The Problem of Noise in Industry". He said that occupational hearing loss arose in, during the course of, or as the result of one's employment, and might be due to (i) mechanical trauma, (ii) acoustic trauma or (iii) exposure to noise. Hearing loss due to noise exposure was the cumulative loss of hearing which was always perceptive in type, and which developed over a period of months or years of employment in hazardous noise levels. Eighty decibels might be regarded as the critical intensity level. It was not for some years that subjective symptoms became evident, because that type of deafness commenced in the high tones, and the important speech frequencies were preserved until severe damage had occurred. Buzzing of ringing tinnitus occurred in about 50% of cases. Vertigo was uncommon. The typical subject was a healthy, young to middle-aged man, without history or evidence of ear disease, whose history did not suggest injury by intoxication or some severe constitutional disease or deafness in the family, but revealed prolonged exposure to noise, and whose audiogram revealed a high tone dip with its peak at the 4000 cycles per second level. Treatment consisted of prophylaxis, because damage sustained by cochlear hair cells was not reversible. Prophylaxis was general and individual. General prophylaxis consisted of technical measures in the factory to lessen the noise, and organizing measures amongst the workers to lessen the time of exposure to noise. Individual prophylaxis consisted of selection of the workers and protection of their ears. In selection of workers, four points were essential: (i) complete otological and audiological examination before employment and placement evaluation before assignment to a job. (ii) Follow-up tests of hearing of workers exposed to noise above the critical intensity level between 60 and 90 days from commencement of employment, or earlier if the noise level was above 100 decibels or if the worker complained of excessive discomfort or tinnitus or excessive temporary hearing loss. (iii) Later follow-up tests at intervals of no more than 12 months. (iv) Reassignment or discharge of a worker if a large change was found in his hearing.

Dr. Reilly went on to say that in protection of the ears the greatest difficulty appeared to be in persuading workers to wear ear plugs or muffs. However, even the best designed protectors would not completely prevent damage by noises of greater than 100 decibels intensity. Implementation of that prophylaxis would be possible only if it was made a legal obligation for both employer and employee. Jet noises introduced further problems, in that they might affect all people in proximity to them, even those who lived near airports. Also, they had been shown to have noise levels above the threshold of pain, and to produce vestibular and central nervous system symptoms of a type not seen with ordinary factory noises. That raised the question of legal obligations being imposed upon the authorities responsible for airports. American authorities had done much work in attempting to elucidate the problem of evaluating the disability of hearing loss. There were four steps between hearing loss and compensation: (i) measurement of the loss; (ii) conversion of the loss into a percentage; (iii) the setting of a value on 100% disability; and (iv) establishing a causal relation between the loss and the noise supposed to have caused it. The Council on Physical Medicine and Rehabilitation of the American Medical Association had pointed out that conventional spoken voice and whisper tests were inaccurate and covered only a narrow range of intensity, and that it was still necessary to standardize methods of use and rules for interpretation of speech audiometry. However, the Council agreed that the basis for evaluating hearing loss must be that of everyday communication, without any artificial aid or any special training being given to the patient. That was because of the principle that a loss of normal function should be evaluated in the absence of any prosthetic device. As a first Australian contribution to that problem, a committee should be set up to standardize audiometry and to investigate the possibilities of research in Australia.

W. F. COOPER (Victoria) read a paper entitled "The Problem of Noise in Industry". He said that industrial noise reaching hazardous levels might produce deafness. A preventive programme for the conservation of hearing embraced intensity and frequency surveys and the adoption of damage risk criteria, the objects being to conserve the hearing of workers and minimize hearing loss, and to prevent economic loss to the employer resulting from occupational hearing losses. Dr. Cooper said that the figures submitted represented high sound intensity levels with the most hazardous component in the lower frequencies. Noise abatement was effected by vibration mountings, enclosures, acoustical treatment, gas-flow muffling, maintenance, segregation and operation modification. Ear protection was effective, but subjects with permanent deafness were eligible for compensation. It was obvious that a careful watch should be kept for hearing loss sustained by employees. Dr. Cooper recommended that industries having a noise hazard should consider audiometric testing as a preemployment procedure and as a periodical check on the effectiveness of the conservation of hearing programmes. A further check should be made at the termination of employment. Auditory fatigue and presbycusis must be recognized. The initial indication was the dip at 4000 cycles per second of the auditory threshold, a dip of 15 decibels arousing suspicion of continued loss and of a handicap requiring rehabilitation.

R. T. C. HUGHES (N.S.W.), in opening the discussion, thanked the speakers for their excellent summary of an important and difficult problem. He said that he had found little to criticize, but wished to refer to two points in the papers. Dr. Reilly's definition of an occupational deafness as deafness in, during the course of or arising out of the occupation did not apply in all States, unless it was understood that "in the course of the work" did not mean "while at work". In New South Wales at least there must

be some relationship to the work. Secondly, Dr. Reilly's statement that prolonged exposure to sounds greater than 80 decibels resulted in permanent damage to the hearing in the majority of people was not true for broad-band noise. The damage risk criteria quoted by Dr. Cooper of 95 to 110 decibels depending on the frequency was probably nearer to the mark, though it was not as critical as suggested by Dr. Cooper, since there was some individual variation in susceptibility. In New South Wales the medico-legal position was not yet quite clear. In Milne *versus* I.C.L. an application for workers' compensation was rejected mainly on the grounds that such a deafness was the result of injury and it was impossible to determine the date of injury. That was a test case that stopped a number of others from proceeding. The Act had recently been amended by stating that this deafness was to be deemed to be a disease of gradual onset, thus bringing it within the provision that the last employer in the noisy industry was responsible. However, there were still difficulties, and Dr. Hughes had not heard of the result of the recent test case. He said that another difficulty from a medico-legal point of view was the estimation of the percentage loss of hearing. Several methods had been suggested based on air conduction, pure tone audiometry. In the Fletcher method the decibel loss at frequencies from 500, 1000 and 2000 were averaged and multiplied by 0·8. In 1953 New York had adopted a similar method that included the 250 and 4000 frequencies. In the A.E.M.A. method proposed in 1942 and modified in 1947, percentage values were given for the loss at 500, 1000, 2000 and 4000, and those were added together. The binaural loss was calculated by multiplying the percentage loss in the better ear by seven, adding the loss in the worse ear, and dividing by eight. In the Wisconsin method the loss at 500, 1000 and 2000 was averaged, and the percentage loss was then given in a table. The binaural loss was calculated by multiplying the loss in the better ear by four, adding the loss in the worse ear, and dividing by five. The Council on Physical Medicine of the American Medical Association had recently given the opinion that the loss should be determined on the basis of the ability to hear speech, but no suitable audiometers had yet become available. The percentage loss in any one case of perceptive deafness was worked out by each of the above methods and found to be 20·5, 28·8, 19·5 and 14·4 respectively, showing the wide variation. With regard to presbycusis, the Wisconsin method suggested allowing ½% at the age of 50 years and an additional ½% for each succeeding year. In another scheme, the allowance was calculated from a graph. However, doubt was expressed that workers' compensation courts would make any such allowance unless it could be proved that some prior deafness existed.

ASHLEIGH DAVY (N.S.W.) said that because of recent changes in the *Workers' Compensation Act* in N.S.W., concerning industrial deafness, it was expected that many claims for compensation would be made. It had been requested that the Section of Oto-Rhinology consider issuing a statement for the guidance of employers, employees, industrial medical officers and the Court regarding, amongst other matters, the following: (i) Having attained the decibels loss, the correct method of ascertaining the percentage loss of hearing in each ear as well as the binaural loss. (At present such computations were made using the Wisconsin, A.M.A. and European method.) (ii) The allowance to be made for presbycusis. (iii) The time that must elapse, be it days, weeks or months, that the employee must be away from noise before an assessment could be made regarding his "permanent" hearing loss. Dr. Davy pointed out that many years previously the Section of Ophthalmology (N.S.W.) had issued a scale of relationship between the actual and the percentage loss of vision, following injury. That scale had been accepted by the Workers' Compensation Commission of N.S.W. Dr. Davy said that for several years the Commonwealth Acoustic Laboratories had been measuring noise sources in industry and in the defence services. That work was now almost complete, and the damage risk of the complicated noises had been reduced to a single reading on a small, easily portable sound survey meter. Dr. Davy felt that the Committee suggested by Dr. Reilly should seek to cooperate with the Commonwealth Acoustic Laboratories.

F. ELLIS (N.S.W.) asked if there were any cases of bilateral hearing loss from exposure to noise in one ear and also if there was any use for individually moulded acrylic ear plugs.

L. GRAY (W.A.) asked if cotton wool was of any use as an ear plug.

A. S. de B. COCKS (S.A.) said that he had met with two or three cases of deafness in telephone operators.

R. S. W. THOMAS (W.A.) had met with three cases of deafness after the use of a telephone.

T. J. RAMSAY (Tasmania) reported one case of telephone deafness.

Dr. Reilly, in reply, said that his definition of industrial deafness had apparently not been understood, and he would restate it. He said that the evaluation of the basis of hearing loss was on the ability to hear speech. There was no simple way of translating pure tone audiograms into speech percentage, and more work should be done on that. The A.M.A. standard method was good for conductive deafness, but not for perceptive deafness. In reply to Dr. Ellis, he said that cases of bilateral loss from trauma to one ear did occur. It depended on the intensity of the sound which must be above the critical level in the other ear. He also said that he had met with deafness after the use of a noisy telephone.

Dr. Cooper, in reply, said that there was a lot of variation in individuals, and there was no predictive test to determine the susceptibility. In follow-up examinations the audiogram should be prepared monthly and later six-monthly to follow the trend of the deafness. He referred to the fact that in New York it was necessary to show loss of wages for compensation purposes. Loss did not occur with partial industrial deafness, and therefore there was no compensation, but that ruling was being varied. With regard to the use of ear plugs, he said that they needed to be complete. Cotton wool or anything porous was of no use. It might be used only for first aid purposes if it was impregnated with vaseline.

SECTION OF PÆDIATRICS AND SECTION OF PUBLIC HEALTH, INDUSTRIAL HEALTH AND HOSPITAL ADMINISTRATION.

Prevention of Accidents in Childhood.

A COMBINED MEETING of the Section of Pædiatrics and the Section of Public Health, Industrial Medicine and Hospital Administration was held to discuss the prevention of accidents in childhood.

F. W. A. CLEMENTS (N.S.W.), in the first paper, said that accidental deaths were now responsible for one-third of all the deaths of children aged between one and 14 years. The trends over the last 30 years had shown a slow decline for most types of accidents, but the rates from falls had at times shown a rise. The pattern of accidents was affected by the environment—for example, traffic accidents were prominent in congested urban areas. The guiding principles of prevention were protection of the child from environmental hazards and education of practitioners, parents and children. The general practitioner could help by correcting hazardous situations observed in the home, and by helping to develop community educational programmes. Auxiliary health workers could help educate parents by instruction, discussion groups and pamphlets. Children must learn through experience the dangers of heat, water, etc. There was need in Australia for coordinated action, with the formation of public committees and a group within the medical profession, and the employment of a full-time officer in health departments concerned with accident prevention activities.

H. M. L. MURRAY (Tasmania) read the second paper. He said that Dr. Clements had given full information about

the magnitude of the problem and had suggested that prevention depended on protection and education of the child. That, in turn, depended on education of members of the public, to make them aware of the importance of accidents and of the fact that most of them were preventible. Something could be achieved by publicity campaigns, advertisements, posters and broadcasts; but they were of very limited value. More could be done by the efforts of a voluntary organization which was interested in the problem, and which used the enthusiasm of its members to interest the public. But, as the City of Aberdeen had shown, the best method of attack was by education on a personal level, and the spearhead of that attack was the health visitor, who had the entrée to the home and was looked upon as a person who supplied information on health matters in simple language and in the course of her normal work.

B. MEREDITH (Victoria) recounted programmes of the Division of Maternal, Infant and Pre-School Health in Victoria, whereby the sisters in the Baby Health Centres made visits to the homes of all infants and children discharged from the Children's Hospital in Melbourne after admission from an accident. That was a fact-finding and educational survey.

N. SOLOMON (N.S.W.) stressed the need for more time in the training courses of school teachers in health matters and particularly in accident prevention.

W. B. MACDONALD (W.A.) gave an account of the display arranged by the National Safety Council of Great Britain at Charing Cross Station, London. He said that it seemed to be popular and in his opinion was a good educational technique. Examples of well protected electric radiators were shown beside defective ones. Coloured photographs showed the effects of burns on children. Two attendants were present to hand out pamphlets and answer questions.

F. ARDEN (Queensland) asked if there were any data on the conditions associated with drowning in children aged one to four years.

Dr. Clements, in reply, said that a high percentage of such accidents occurred in waterholes and creeks around the home.

J. FINNEY (Victoria) asked if there was any information to explain the higher incidence of accidents in boys aged one to four years than in girls.

Dr. Clements, in reply, said that some information was available to show that many boys tended to play with older boys, and girls to play with their older sisters. Fathers tended to take their sons in the car and not their daughters.

E. DONALD (Victoria) thought that the medical profession could do much to stimulate and motivate parents to take an interest in accident prevention and to attend classes or group discussions on the topic.

SECTION OF PUBLIC HEALTH, INDUSTRIAL MEDICINE AND HOSPITAL ADMINISTRATION AND SECTION OF RADIOLOGY AND RADIOTHERAPY.

Radiation Hazards in Industry.

A COMBINED MEETING of the Section of Public Health, Industrial Medicine and Hospital Administration and the Section of Radiology and Radiotherapy was held to discuss the subject of radiation hazards in industry.

G. C. SMITH (New South Wales) read a paper entitled "Radiation Hazards in Industry". He pointed out that an increasing number of persons was becoming occupationally exposed to artificial sources of ionizing radiation, which had been listed. Irradiating apparatus was used in industry for radiographic and fluoroscopic purposes and by certain professional, research and commercial personnel. Radioactive substances, especially those produced artificially, were being used on an increasing scale for medical purposes, for numerous research activities, and in industry as sources for gamma radiography, as thickness gauges, and for a variety of other applications. Uranium mining and processing provided another source of radiation exposure. The types of radiation most likely to be encountered from the processes mentioned were alpha particles, beta rays, gamma rays and X rays, and injury to the human subject might occur as a result of external or internal irradiation. Dr. Smith then referred to hazards, injuries and radiation dosages as they affected miners working in radioactive ores, luminizers, radiologists, pædiatricians, veterinary surgeons and other groups of workers. He said that the known effects of radiation comprised skin lesions of various types, including malignant changes, cataract, necrosis and sarcoma of bone, damage or other effects to the blood and blood-forming tissues leading in some cases to aplastic anæmia or leukæmia, cancer of the lung, sterility and impaired fertility. The risk of genetic damage was also an important possibility. Protection involved the application of measures to prevent deposition of active material in the body and to reduce external radiation to the lowest practicable limit. In a brief reference to the health aspects of uranium mining and processing, Dr. Smith said that the hazards included exposure to radon and its daughter products, risk of lung cancer, and possibilities of kidney damage due to the toxic effect of uranium itself and pneumonoconiosis. Discussing legislative control of hazards, Dr. Smith said that within recent years four States of the Commonwealth of Australia had introduced legislation to control the use of radioactive substances and certain irradiating apparatus and thereby to prevent injury from ionizing radiations. At the Commonwealth level importation of radioactive substances was prohibited unless approval had been obtained from the Director-General of Health, and regulations governing the carriage of radioactive substances by aircraft and by post were in operation.

H. A. S. VAN DEN BRENK (Victoria) read a paper entitled "The Radiation Hazard as it Affects Medical Practice". He outlined the broad principles governing dose-effect relationships with regard to radiation damage to tissues and applied them to certain data available for radiation mutagenesis and carcinogenesis from human and experimental sources. Attention was directed to the "genetically significant radiation" dose from diagnostic radiology and the relative contributions of different diagnostic procedures. Dr. van den Brenk discussed the question of a threshold dose in relation to the leukæmogenic and carcinogenic effects of radiation and advocated a balanced outlook on medical radiation hazards. He particularly mentioned the danger of limiting radiological diagnosis and treatment by an unwarranted emotional appraisal of radiation hazards divorced from the practical considerations necessary in the medical care of an individual patient.

D. GORDON (Queensland), in opening the discussion, said that in the model legislation designed to control radioactive hazards, medical practitioners using diagnostic apparatus were not included. The Queensland Branch of the British Medical Association had been asked to comment on that legislation, and after taking counsel from the Brisbane radiologists, had requested that in that respect the medical profession be controlled and their diagnostic X-ray plants be licensed. That decision had been made because, since the model legislation had been drafted, diagnostic radiology had become suspect as a major source of trouble. It was thought that a number of plants might be defective and should be checked, and that a lot of general practitioners left teaching hospitals and went to small country hospitals, where they had to use an X-ray plant. Giving a licence to those men would not be so much an examination as a brief instruction in safe methods of using an X-ray plant. Some of them did not know even simple precautions, such as shielding the gonads. Some years previously, Dr. Gordon had not supported that view, but the new evidence which had come to light in the last two years had made him change his mind, and he supported it strongly.

LANCE TOWNSEND (Victoria) said that he had been shocked by the publication of Alice Stewart on the occurrence of leukæmia in children exposed to diagnostic radiation *in utero*. He had begun an investigation of his own, and a preliminary survey had failed to confirm her findings.

W. P. HOLMAN (Victoria) pointed out that all workers using irradiating apparatus should be licensed, and that doctors were quite agreeable to being included. In all lines of essential investigation the infinitesimal risks to the patient were negligible in relation to the advantages.

R. T. C. HUGHES (New South Wales) asked whether it was the practice to shield the gonads when the lumbar part of the spine and pelvis were being examined radiologically.

M. G. F. DONNAN (Western Australia), as President of the College of Radiologists of Australasia, confirmed the fact that that was current practice.

H. HOLDEN (Tasmania) pointed out that when isotopes became available to industry, technicians would have to be trained properly in their use.

A. BELL (New South Wales) said that the Atomic Energy Commission was holding such courses.

DR. C. F. MACDONALD, from the chair, said that the combined meeting had been worth while in helping to dispel some of the perplexity and confusion which had recently arisen round the important question of radiation hazards. It was certainly a question of vital interest to those who directed the X-ray departments of women's hospitals, where one was called upon frequently to use such investigations as pelvimetry and salpingography. Radiologists—some like himself who for years had combined both X-ray therapy with radiodiagnosis—had always had an acute awareness of the dangers of excessive radiation, and they had always endeavoured to restrict their radiodiagnostic techniques and dosages to what was regarded as safe by radiobiologists and radiophysicists of the highest international repute. He had in that matter always worked in the closest concert with the late Dr. Cecil Eddy. Even in that thorough pelvimetry which some had practised, all the available evidence until a year or two ago had fortified radiologists in the belief that they were doing no harm to a mother or to her genetic potential. It was important for the medical profession and the public generally to know that never at any time had there been by the trained radiologist indiscriminate radiodiagnostic spraying of anyone, man, woman or child. Radiologists had always been just as solicitous about the effects of radiation on their patients as on their valued assistants, the technicians, male and female. Speaking for himself from 34 years' experience, Dr. Macdonald said that he had seen no painful radiation effects on patients from radiodiagnostic procedures carried out in proper hands. However, Dr. Alice Stewart's pronouncements from Oxford on childhood leukæmia occurring after X-ray examination of the pregnant mothers had greatly startled many people, and certainly her statements had warranted further investigation into their validity. Thus, at the Royal Women's Hospital, Melbourne, the Professorial Unit with its wide resources, in conjunction with his own department, was at present engaged in investigating for the committee appointed by the Commonwealth Government the subsequent histories of 1000 mothers, and those of the children and in many cases of the grandchildren of those patients who at one time or another in the past had had obstetrical X-ray examinations. It was hoped, as the result of that comprehensive inquiry, to speak with some confidence at least about radiation hazards in a women's hospital X-ray department, and they were looking forward keenly to meeting Dr. Alice Stewart in Melbourne later in the year.

Dr. Smith, in reply, said that in the past 18 years he had performed blood counts on many industrial workers engaged in a wide variety of occupations. In that group, he could recall having seen only one man suffering from leukæmia, and he had been exposed to ionizing radiation at his work. Another man in whom Dr. Smith had been interested, a veterinary radiographer, developed aplastic anæmia which led to his death. Dr. Smith said that as a member of the committee which prepared the "model" legislation, he had always been of the opinion that diagnostic radiology should be subject to statutory licensing or registration. Concerning blood counts in the control of radiation hazards, he said that in recent years the value of periodical counts as a routine measure had been questioned, and there was now an increasing tendency to discard those examinations in circumstances where regular monitoring of both personnel and workplaces was undertaken. The chief value of the blood test perhaps was in the pre-employment examination, and he did not think there was any question about the need for a full blood count prior to engagement on work involving exposure to radiation.

Section of Anaesthesia.

President: R. H. Orton, M.B., B.S., F.F.A. (R.C.S.), F.F.A. (R.A.C.S.), D.A., Victoria.

Vice-Presidents: S. V. Marshall, M.B., Ch.M., F.R.A.C.P., F.F.A. (R.C.S.), F.F.A. (R.A.C.S.), D.A. (R.C.P. & S.), New South Wales; A. W. Wall, M.B., B.S., F.F.A. (R.A.C.S.), South Australia; R. A. Lewis, M.B., B.S., D.A., F.F.A. (R.A.C.S.), Tasmania.

Honorary Secretary: Jean Oakes, M.B., Ch.B., M.F.A. (R.A.C.S.), Tasmania.

Some Aspects of Fluothane Anæsthesia.

R. H. ORTON (Victoria) took as the subject of his presidential address "Some Aspects of Fluothane Anæsthesia". He said that considerable literature had accumulated on the clinical features of fluothane since the appearance of Johnstone's first article in September, 1956. However, apart from the work of Raventos, little experimental material had been published, and many of the actions of the drug were poorly understood. He proposed to deal briefly with some aspects which, to the best of his knowledge, had not been recorded previously. When fluothane was first made available to him for clinical trial, he decided to attempt to estimate the change in minute volume of respiration that took place under its influence. That was done in a gross manner by using a Magill type system, but incorporating a Rubens non-rebreathing valve at the face piece. By adjusting the flow meters of the gas machine so that the reservoir bag remained at a constant volume, it was possible to estimate the minute volume of respiration directly from the delivery of gases into the bag. With the induction of light anæsthesia, the minute volume of respiration usually fell. If, at that stage, a surgical stimulus was applied, the patient would respond with an increased respiratory rate and a return of minute volume towards normal. If, however, the patient was carried to a deeper plane before the commencement of the operation, then the respirations would remain at a rate between 24 and 30 per minute. It was regularly found that, under those circumstances, the minute volume of respiration was greatly reduced, usually to about four litres per minute in an adult patient, and at times it fell as low as two litres per minute. With that degree of respiratory depression it seemed likely that the carbon dioxide levels in the blood would be high and that controlled respiration was essential. Accordingly, a Liston-Becker carbon dioxide analyser was introduced into the respiratory circuit so as to read alveolar carbon dioxide levels. Dr. Orton said that, much to his surprise, it was found that, in spite of the low minute volume of respiration, the carbon dioxide level was slightly below normal—namely, about 35 millimetres of mercury partial pressure. It was found, with variation of depth of anæsthesia, that the carbon dioxide level remained remarkably constant, in spite of large changes in respiratory minute volumes. Controlled respiration was then investigated under fluothane anæsthesia. After induction with thiopentone and intubation under succinylcholine, anæsthesia was maintained with about 1% fluothane in a mixture of nitrous oxide and oxygen (1:1). Control of respiration could not be established until the carbon dioxide level was lowered to about 25 millimetres of mercury, but that figure was reached with very gentle ventilation. It was difficult to avoid lowering the carbon dioxide levels to very low figures because of the shallow ventilation required. In the early cases, prolonged apnœa was common; but once the carbon dioxide analyser had been incorporated in the system and the necessary ventilation determined, that was soon avoided. In some patients, controlled respiration was accompanied by a fall of systolic blood pressure to levels as low as 50 millimetres of mercury; but those falls could be reduced by a careful reduction in the minute volume of respiration. From that investigation, it appeared that it was not necessary to augment the lowered minute volume of respiration that occurred with fluothane anæsthesia. The diminished ventilation was not accompanied by a rise in carbon dioxide tension in the blood. For many operations not requiring profound relaxation, very good conditions could be provided with fluothane under voluntary respiration.

Dr. Orton then said that, at that stage, consideration was given to the apparent paradox of depressed respiration and normal carbon dioxide level. It would appear likely that the explanation was a lowered production of carbon dioxide when a concentration of fluothane was present in the bloodstream, and that that could be associated with a diminished oxygen concentration. Such a state was not new. Morphine, for example, was known to depress metabolism. However, it was usually stated that that was not significant in clinical dosage. Fortunately, at that time, a case of morphine poisoning came under observation. That person had taken, by hypodermic injection, probably about two grains of morphine. The respiratory rate was four per minute, and the patient was just rousable when first seen some 24 hours later. Carbon dioxide levels in that patient were normal in spite of a low minute volume of respiration. The possible implications of that effect of fluothane and morphine were considered. It seemed probable that with voluntary respiration, the oxygen consumption was lowered. Dr. Orton presented an example and showed how the oxygen consumption had fallen by the same percentage. He said that the low figures of minute volume he had quoted were frequently encountered with fluothane anæsthesia, and suggested that oxygen consumption by the body during fluothane anæsthesia might be very low. Such a finding could have far-reaching implications. It would account for the fact that fluothane had proved beneficial in poor-risk patients and in patients with diminished respiratory function.

Dr. Orton went on to say that in an attempt to obtain confirmatory evidence for that thesis, experiments had been carried out on dogs under fluothane anæsthesia. Anæsthesia had been induced in mongrel dogs with small doses of thiopentone after premedication with morphine and atropine. After laryngeal intubation, anæsthesia had been maintained with fluothane, nitrous oxide and oxygen as in human subjects. Thoracotomy had been performed and circulatory arrest produced by complete inflow occlusion of the heart. The dogs had been allowed to breathe spontaneously until the chest was opened, when controlled respiration was established. High concentrations of fluothane (about 3%) were employed. Under those circumstances, marked depression of respiration occurred and the blood pressure fell. If anæsthesia with controlled respiration was continued, the blood pressure would fall to zero and the heart stop. However, an arbitrary figure of 30 millimetres of mercury systolic pressure had been selected as the low limit and at that point the circulation had been occluded. So far dogs had fully recovered from 10 minutes of occlusion without showing evidence of cerebral damage.

Dr. Orton said that it might be necessary to alter the present ideas of respiratory depression. At least, with fluothane, it appeared that the diminished minute volume was a reflection of lowered metabolism. Under those circumstances, the respiratory depression could have no deleterious effects on the patient. For some time, attempts

had been made to lower metabolic processes by cooling. However, with safe degrees of hypothermia, it was not possible to lower metabolism below 50% of its value at normal temperature. It appeared possible that a comparable depression of metabolism might be possible with deep fluothane anæsthesia and without the cardiac irritability associated with hypothermia. A passing thought was that Swann, who had achieved some of the best results with hypothermia, used deep ether anæsthesia to control shivering. Recently he had been performing his intracardiac operations at temperatures as high as 32° C. Dr. Orton wondered whether it could be that Swann was using the principle of deep anæsthesia to lower metabolism and not hypothermia.

Dr. Orton, in conclusion, said that fluothane was an extremely potent anæsthetic agent. It must be administered with considerable caution. The depression of respiration might be ignored. If controlled respiration was used in its presence, the ventilation should be just sufficient to obtain control, otherwise very low values of carbon dioxide would occur. Hypotension might be produced by fluothane, and it was probably, at least in part, due to a fall in cardiac output. That fall might not be deleterious, because of the associated lowered metabolism. Recovery from fluothane anæsthesia was rapid when light planes had been employed, but might be more prolonged from deep planes. Further investigations into the properties of fluothane might lead to a new idea of the significance of deep anæsthesia.

T. P. CRANKSHAW (Victoria), in opening the discussion, said that Dr. Orton's views on fluothane anæsthesia had helped him to carry out work in his own department. Experience of prolonged apnœa on assisting respiration after intubation with succinylcholine during the administration of fluothane had convinced him of the truth of Dr. Orton's findings relating to carbon dioxide tensions in the blood. Dr. Crankshaw said that in his department they had avoided using controlled respiration with that agent, and had not been worried with significant hypotension. The use of a cathode ray electrocardiograph had not revealed any cardiac irregularities of consequence. As an economy measure, they had used only closed-circuit administration with a basal flow of oxygen and a minimal amount of nitrous oxide. Dr. Crankshaw then sounded a note of warning. He said that reports of some anæsthetists who had experienced severe hypotension and cardiac arrhythmias in their use of the agent suggested that unsuitable apparatus had been used, with resultant overdosage.

G. R. TROUP (Western Australia) asked whether Dr. Orton made electrocardiographic records during his series of cases of fluothane anæsthesia.

Dr. Orton, in reply, said that he had done so. There had been only one severe irregularity, a nodal rhythm in a case of coarctation of the aorta.

MARIE COCKBILL (Victoria) asked whether morphine or "Omnopon" aggravated respiratory depression.

Dr. Orton, in reply, said that they did, and that they were sometimes deliberately used for that reason. Investigations had shown that morphine and allied drugs also decreased carbon dioxide production. Artificial pulmonary ventilation must be very much reduced, otherwise a very low alveolar carbon dioxide tension would occur and persist for half an hour or more, with apnœa.

Some Problems of the Open Chest.

G. R. TROUP (Western Australia) read a paper entitled "Some Problems of the Open Chest", based on a series of 449 operations at a thoracic unit in a large but sparsely populated area over a period of two years, 1955 and 1956. There were 21 deaths (4·5%). Dr. Troup said that the pattern of operations, deaths and complications was about the same as that of other similarly situated centres. He presented in tabular form the operations performed, the classification of the fatal cases and the complications, and said that he proposed to deal with two problems that had raised most doubt in his own mind as to the effects he was producing when confronted with the open chest. The first problem was that of occlusion and exclusion of various parts of the tracheo-bronchial tree, the importance of which depended on the underlying pathological condition. The risk of "spill over" in the wet pulmonary tree had now largely been counteracted by efficient pre-operative preparation of the patient, although it could still create an anæsthetic hazard at times. Leakage of air and gases to the outside and into the pleural space from bronchopleural fistulæ constituted another. Perhaps not the least important indication for some type of blockage was the surgeon's desire for an immobile lung on which to work, which might be a debatable reason, and depended on environment in the widest sense of the word. One could, of course, keep the lung relatively quiet without resorting to "blocks," but only at the expense of a generally diminished respiratory exchange; that was possibly of significance in creating respiratory acidosis. No one single method of blocking was completely satisfactory. The number of patients with bronchial fistulæ requiring operation was small, no one anæsthetist saw enough of them to be dogmatic about their management, and each case would be different from every other. The accurate placing of blockers and their maintenance in the original position were fraught with uncertainty. As a simple alternative, there remained one-lung anæsthesia by blind endobronchial intubation, which could be produced on the right side almost without fail and on the left side very frequently. When the attempt on the left side failed, the tube could be left in the trachea until the chest was opened, the surgeon could occlude the right main stem bronchus, and the tube could then be pushed down into the left side. In some rare cases that technique would not be adequate; but it was only when the fistula on the right was large or had a valve-like opening that the difficulty would be so great as to require a blocker. Dr. Troup said that the criticisms of one-lung anæsthesia were (i) the risk of flooding and (ii) the theoretical disadvantage of the arterio-venous shunt in the lung under operation; on the right side there was also the disadvantage of blocking of the orifice of the upper lobe bronchus. Efficient suction and bronchoscopy, which were "musts", would obviate the risk of flooding. The consequences of arterio-venous shunt were theoretical and difficult to estimate. It was to be remembered that Organe in 1949 had described the technique of intubating the right bronchus in cases of patent *ductus arteriosus*. Turning to the second problem, that of respiratory acidosis, Dr. Troup said that it was the most serious problem once the pleural cavity was opened. As Orton had pointed out in 1952, a tidal exchange diminished by only 30% would double the alveolar carbon dioxide concentration. On the other hand, to halve the alveolar carbon dioxide concentration, the ordinary tidal exchange would have to be increased by 77% by hyperventilation. It was therefore difficult to produce a degree of hyperventilation that would do harm. Dr. Troup said that he had carried out some investigations of the blood pH on patients most of whom were having one-lung anæsthesia. Ten cubic centimetres of venous blood were taken in a heparinized syringe and sent at once to the biochemistry laboratory close to the operating theatre block at the Royal Perth Hospital. The pH estimations were made electrometrically, and the results were usually obtained within five minutes. The majority of the readings were well within the normal range of 7·35 to 7·45; the highest was 7·6 and the lowest 7·25. Dr. Troup drew attention to the risk that might be associated with the giving of massive transfusions of citrated blood, the pH of which might be below 6·50. Dr. Troup said in conclusion that respiratory acidosis was a major problem, bound up with such recent developments in respiratory physiology as the importance of lung compliance in disease, intraalveolar mixing and the circulatory phenomena associated with the open chest. Much work remained to be done.

T. THOMSON (Tasmania), in opening the discussion, said that the problem of respiratory acidosis occurring during anæsthesia was not one of defective pulmonary ventilation. Most anæsthetists would agree that it was better to err on the side of hyperventilation that to risk underventilation. Therefore, if pulmonary ventilation was

adequate, the fault could lie in defective gaseous exchange. Briefly, some of the factors causing defective gaseous exchange were positive pressure anæsthesia, with its effects on the hæmodynamics of the pulmonary vascular bed, and collapsed lung, producing an arterio-venous shunt. It had been shown that, although the carbon dioxide tension of end tidal samples might be below 40 millimetres of mercury in the presence of collapsed lung, arterial carbon dioxide tensions might be above normal. One authority stated that, provided the accumulation of carbon dioxide in the apparatus was avoided, it was possible to maintain normal alveolar carbon dioxide tensions with the patient in the dorsal position, and that those levels agreed closely with the arterial carbon dioxide tensions; but in the lateral position, in the presence of pulmonary disease or with an open chest, there was uneven gas distribution in the lungs, and perfusion-ventilation relations were disturbed. That led to inequality of the alveolar and arterial carbon dioxide tensions. Dr. Thomson then said that Dr. Troup had pointed out that citrate before being metabolized might lower the pH of the blood. A recent paper in *The Lancet* by Fink *et alii* had stated that citrate, even in small doses, produced vasoconstriction of the pulmonary vascular bed, leading to overloading and heart failure during rapid transfusion of citrated blood. Fink *et alii* stated that that did not occur with heparinized blood, and that the effect of citrate on the pulmonary vessels could be counteracted by the simultaneous administration of calcium gluconate and procaine. It might be that vasoconstriction of the pulmonary vascular bed, together with the effects of positive pressure respiration, were dual factors in the production of diminished gaseous exchange, with resulting respiratory acidosis. Finally, it might be that too much reliance was placed on carbon dioxide absorbers. Recent work drew attention to the fact that even with high flows of gases, carbon dioxide levels in the inspired gases, even with fresh soda lime, were of the order of 0·3% to 0·7% (eight to 17 times the level in the atmospheric air), and that obviously, at the lower flow rates of gases which were commonly used, carbon dioxide absorption was still less efficient.

W. H. J. COLE (Victoria) mentioned some of the practical difficulties in endotracheal anæsthesia, and pointed out that of the many different methods available, most were interchangeable according to the anæsthetist's preference and to circumstances in general.

Misuse of Relaxing Agents.

S. V. MARSHALL (New South Wales) read a paper entitled "Misuse of Relaxing Agents". He first gave a short review of the introduction and development of the relaxing agents in relation to general anæsthetic practice, and indicated briefly the differing actions of the depolarizing and non-depolarizing (competitive-blocking or curariform) drugs. He referred to unexpected and alarming departures from the usual responses to those drugs in various circumstances, and drew attention to an American survey by Beecher and Todd, in 1954, which in nearly 600,000 surgical cases had revealed an almost six-fold increase in the number of anæsthetic deaths when relaxing agents were used. Dr. Marshall urged the imperative necessity to maintain efficient pulmonary ventilation throughout the period of the drugs' action, and said that alleged "sparing" effects on respiration should be disregarded. He condemned their use for trivial purposes, when simpler anæsthetic procedures would suffice, and deplored their use to facilitate so-called minimal anæsthesia. Dr. Marshall went on to say that restriction to one relaxing agent, especially in large initial dosage (for example, gallamine for intubation), might lead to serious cumulative effects, necessitating excessive recourse to neostigmine. He said that better results were often obtained by commencing with the depolarizing agents in moderate dosage and following with the curariform preparations, also in moderate dosage. Slight deepening of the anæsthesia or moderate hyperventilation would often obviate the necessity for supplementary doses of the relaxants. Dr. Marshall then said that *myasthenia gravis* was an absolute contraindiction to the use of the curariform drugs, but incipient forms of the disease sometimes escaped detection and represented a grave hazard. Therefore, initial test doses of the curariform drugs should always be employed. If there was any doubt, the depolarizing agents only should be used. Dilution of the relaxing preparations and of neostigmine offered some protection against unexpected responses to those agents. Despite widespread belief to the contrary, the use of atropine and neostigmine in appropriate dosage was imperative when curariform drugs had been employed, in order to disperse any residual effects. Dr. Marshall said in conclusion that it was obvious that the relaxing agents were potentially dangerous drugs, and that they should always be used with the greatest care. Their casual and haphazard employment was absolutely unwarranted, especially by those lacking adequate training and facilities. Under proper conditions they could provide invaluable aid to surgery, even that of a minor nature; but that fact never justified their grave misuse, which was frequent at the present time.

R. LEWIS (Tasmania), in opening the discussion, said that Dr. Marshall's paper was a timely warning to most of those present. They knew that abuse of relaxants was far too prevalent, and offenders were both specialist anæsthetists and general practitioners alike. Unfortunately the ease of administration, the apparent simplicity of maintenance of anæsthesia and the ideal operating conditions outweighed by far their insidious dangers. The surgeon today expected their use, even in situations where no true relaxation was necessary—for example, in operations on varicose veins, in simple inguinal herniotomies and in orthopædic procedures on the extremities. As Dr. Marshall had said, excessive dead space with high carbon dioxide levels was too often permitted, especially with closed-circuit anæsthesia and relaxants. That was seen when a mask and a Waters's canister were separated by a length of corrugated tubing: it relieved the anæsthetist from supporting the awkward weight of the canister, but imposed an additional several hundred cubic centimetres of dead space on the unfortunate patient. Dr. Lewis said that he disagreed with Dr. Marshall's insistence on the use of atropine and "Prostigmin" in every case in which a curariform drug had been used. Surely after a reasonable interval of time, and provided that normal respirations had returned, that should not be necessary. Dr. Lewis asked whether Dr. Marshall could assure them that the use of those two drugs in such cases was without risk of severe bradycardia or sudden cardiac arrest. Dr. Lewis finally said that if all anæsthetists made sure that they thoroughly understood the basic principles of pharmacology and physiology associated with the use of relaxants in anæsthesia, they would have fewer technical worries, fewer post-anæsthetic complications and greater respect from their surgical colleagues.

PATRICIA WILSON (Victoria) said that she did not agree with the use of a number of relaxants in the same anæsthetic.

G. R. TROUP (Western Australia) asked what was the relaxant of choice in anæsthesia for a severely asthmatic patient.

Dr. Marshall said that ether was.

M. C. PIERCEY (Victoria) asked Dr. Marshall what was his opinion of "Laudolissin".

Dr. Marshall, in reply, said that it was expensive and of an awkward volume, and formed a particularly messy and sticky gum if it came into contact with "Pentothal".

T. P. CRANKSHAW (Victoria) said that Dr. Marshall's experience and ability could not be disputed, and he undoubtedly used polypharmacy with relaxants without risk to the patient. Dr. Crankshaw asked Dr. Marshall to describe how he taught his residents to use that technique. He agreed with Dr. Marshall's use of neostigmine in every case, provided that an estimate was made of the required dosage. A dose of 2·5 milligrammes of neostigmine combined with atropine should not be exceeded.

Local Anæsthesia for Radical Mastectomy.

GWENIFER BERNARD (New South Wales) read a paper entitled "Local Anæsthesia for Radical Mastectomy". She said that local anæsthesia should be considered for radical mastectomy in the very elderly and in the advanced cardiac patient. The patient was premedicated two hours before operation with morphine and hyoscine, with due regard for her age, size and general condition. Three principal sets of block injections were performed, and a fourth set of cover blocks. The first was a brachial plexus block. The second was a field block, in a rough square having as its four corners the acromio-clavicular joint of the affected side, the opposite sterno-clavicular joint, the tip of the opposite ninth costal cartilage, and the ninth rib in the post-axillary line of the affected side. Thirdly, the third to eighth intercostal nerves were blocked posteriorly. The cover blocks filled in the corners of the foregoing square with a series of fanwise injections. Then the breast was lifted, whilst injections were made between it and the underlying muscle. "Xylocaine" (30 cubic centimetres of 2% solution) was used for the brachial plexus block. For all other injections, eight to ten ounces of 0·5% "Novocain" solution were used. One or two minims per ounce of 1 in 1000 adrenaline were added to both solutions. Labat's syringe and needles were used throughout the injections; for the brachial and intercostal blocks the five to seven centimetre needles were used, and for the field blocks the 12 centimetre needle. Dr. Bernard said that the technique produced complete anæsthesia and was without complications if performed as described.

PATRICIA WILSON (Victoria), in opening the discussion, said that she disagreed with the use of hyoscine in aged patients. She recommended the use of a barbiturate with premedication when local anæsthesia was being employed. Dr. Wilson said that the use of large quantities of local anæsthetic agents in the aged might be dangerous.

R. LEWIS (Tasmania) suggested the use of combined general and local anæsthesia.

T. E. WILSON (New South Wales) said that from the point of view of the surgeon, operating conditions with the method of anæsthesia described were very good.

Anæsthesia for the Diabetic.

P. L. JOBSON (N.S.W.) read a paper on anæsthesia for the diabetic, with particular reference to the pregnant diabetic. He said that his paper was based on personal experiences and opinions, and did not attempt a comprehensive survey of the subject. To begin with, his opinion was that the diabetic was not a neurotic, but knew himself and his disability. Dr. Jobson went on to discuss three theories as to the mode of action of insulin: (i) facilitation of the passage of glucose across the cell membrane; (ii) catalysis of the hexokinase phosphorylation reaction to glucose-6-phosphate; (iii) antagonism of adrenocortical and adrenohypophyseal hormones. He said that the first was the one he used in considering the physiology of a diabetic state. Muscular activity had an insulin-like action, and adrenaline raised the blood sugar level. Glucose was absorbed rapidly from the small intestine, but very slowly from the stomach and large bowel. In a person weighing 70 kilograms, the small intestine would continue to absorb 126 grammes of glucose per hour for long periods without the appearance of glycosuria. The renal threshold for glucose was about 180 milligrammes per 100 cubic centimetres. The liver contained about 100 grammes of glycogen, which equalled about five hours' supply of glucose at normal rates of activity. More sugar was formed if required by gluconeogenesis; but in the absence of normal carbohydrate metabolism fat breakdown became abnormal, with the formation of β-hydroxy-butyric acid and ketones, leading to acidosis and coma. Daily insulin secretion by the normal person was of the order of 60 to 80 units. Insulin was antagonized by anterior pituitary and adrenocortical hormones.

Turning to diabetes and pregnancy, Dr. Jobson said that pregnancy was a strain on the pancreas, probably hormonal, and constant supervision and stabilization were necessary. Fœtal death near term was likely, and many obstetricians terminated pregnancy by Cæsarean section at the thirty-sixth week or earlier if necessary.

Referring to anæsthesia and the diabetic, Dr. Jobson said that pregnancy and surgery constituted stresses and provoked a stress reaction, with secretion of adrenaline and adrenocortical hormones. Ether and chloroform raised the blood sugar level and were hepatotoxic; thiopentone, cyclopropane and relaxants had little effect. The relaxant he preferred was tubocurarine. Diabetics having operations of election should be admitted to hospital and stabilized some days before operation. On the day of operation, insulin and carbohydrate were given in balanced amounts. Dr. Jobson pointed out the advantages of bread and butter over the usual glucose solution by mouth. He said that glucose-saline was also given intravenously during operation, with more insulin if thought necessary. In view of the figures he had given earlier, glucose overloading seemed unlikely. The problem of emergency surgery in diabetics sometimes involved endotracheal anæsthesia, gastric aspiration and the intravenous administration of glucose-saline with insulin. Premedication might be by any of the usual methods, but should be kept very light. In maintenance of anæsthesia, ether and chloroform should not be used, thiopentone should be kept to a minimum, and cyclopropane, nitrous oxide and relaxants should be mainly used. After operation the urine should be tested every hour, and further insulin and glucose should be given as indicated, it being borne in mind that soluble insulin took about one hour to come into action and reached its maximum effect in three hours; its effect lasted altogether for about six hours.

W. H. J. COLE (Victoria), in opening the discussion, said that his own experience of anæsthetizing diabetic patients was mainly for operations in which gangrenous toes or feet were amputated. Such patients were frequently old, overweight, or suffering from cardiac failure. Anæsthesia was induced with a small dose of thiopentone followed by a sequence of either cyclopropane, nitrous oxide and oxygen or fluothane, nitrous oxide and oxygen to a light plane of anæsthesia. Concentrations of fluothane as low as 0·2% had been satisfactory. Glucose given by mouth as a pre-operative treatment was best avoided. If glucose had to be given, it was better to administer it intravenously in a fairly concentrated form, to avoid the infusion of large amounts of fluid into a patient with possible congestive cardiac failure. At times surgeons wished to have the patient placed prone, to facilitate amputation at the middle of the leg. In such cases an endotracheal tube was introduced with thiopentone and a relaxant, and the patient's respirations were artificially controlled.

R. H. ORTON (Victoria) spoke against the over-enthusiastic preparation of the diabetic with quantities of glucose given by mouth. It was unpleasant to take, and diabetics disliked sweet things even more than most people. Dr. Orton said that he preferred to give no glucose and no insulin before operation, and to time the operation for the morning if possible.

The Patient and the Anæsthetist.

T. P. CRANKSHAW (Victoria) read a paper entitled "The Patient and the Anæsthetist". He said that satisfactory human relations should be developed between the patient and his anæsthetist. On the day preceding the operation a visit should be made to the patient, with the purpose of becoming acquainted with him, and explaining the type and nature of the anæsthetic. A feeling of apprehension developed in the patient as the time before the operation became shorter. He might have (i) fear of a fatal termination, (ii) fear of the unknown or (iii) fear engendered by the memory of a previous experience. The problem of management fell into two periods: (i) from the time when the patient knew an operation was necessary until his admission to hospital; (ii) from the time of his admission to hospital until the induction of anæsthesia. The second period was under the control of the anæsthetist. The use

of hypnotic drugs dispelled fear during the early part of the second period. Ataractic drugs helped in the intermediate period of waiting until the pre-operative medication with hypnotic or narcotic drugs was given in preparation for anæsthesia. Many factors had to be considered in assessing the amount of premedication. An intravenous agent was used almost universally for induction of anæsthesia. With thiopentone, intraarterial injection was an ever-present hazard. In that eventuality, treatment with procaine, and perhaps with heparin and the performance of sympathetic nerve block, was used. Dr. Crankshaw finally said that discomfort in the post-anæsthetic period could be the result of residual curarization, which might be corrected by using neostigmine.

S. V. MARSHALL (New South Wales) said that smokers should be asked to reduce the amount of their smoking if possible, but it was useless to tell them to stop it, and probably it made little difference to the anæsthetic. Premedication should be adequate; but the patient, on arriving in the operating theatre, should know who he was, where he was and on which side was the lesion proposed for operation.

MARGARET NICHOLSON (Tasmania) asked what was the best way to handle the heavy smoker.

Dr. Crankshaw, in reply, said that not much modification of smokers' habits could be made at the last minute, and it did not seem to matter so much as one would expect.

W. H. J. COLE (Victoria) said he thought that chain smoking caused tachycardia and increased post-operative vomiting.

G. R. TROUP (Western Australia) said that he thought the use of the stethoscope had its greatest value in the reassurance of the patient.

Anæsthesia in General Practice.

R. CLARK (Victoria) read a paper entitled "Anæsthesia in General Practice". He began by pointing out that in Australia the general practitioner was expected to give an anæsthetic for a considerable variety of operations and, because of the long distances between the main centres, to manage with the minimum of apparatus, though an increasing number of hospitals were now equipped with modern gas machines. He said that open ether was still the safest and most useful anæsthetic for the general practitioner. Thiopentone induction was now universal and was expected by the patient. The sequence most normally taught in the medical schools was thiopentone-ethyl chloride-ether. The dosage of thiopentone should be just enough to produce sleep, and this depended on many factors including premedication. For this Dr. Clark favoured 50 milligrammes of "Phenergan" and 1/100 grain of atropine, the former having the advantage of producing sedation without depressing respiration. With very robust patients he used 50 milligrammes of pethidine as well. He warned of three traps in the use of ethyl chloride. The first was that many people gave it too quickly, and then wondered why the patient coughed; he advised commencing with two or three drops to each breath, then gradually increasing the rate of delivery. The second was that ethyl chloride was a very potent drug, and could cause severe damage to the heart in the presence of anoxia; obstructed respiration was especially dangerous with ethyl chloride. The third was that overdosage was easy, and particularly so with a child.

Dr. Clark then discussed laryngeal spasm, saying that it could nearly always be avoided, and was usually produced by administering ethyl chloride or ether too quickly, by inserting a pharyngeal airway too early, or by ignoring the warning of laryngeal stridor. The last usually meant that the patient was objecting to something, and if that was not corrected, spasm was likely to follow. Once spasm had occurred, he recommended removing the anæsthetic mask and airway, if present, holding the chin well up, and having the oxygen mask ready for the patient's first breath. Attempting to intubate only made the spasm worse. He stressed the importance of a perfect airway, recommending the use of the largest pharyngeal airway that could be tolerated. Where relaxation was important, as in upper abdominal surgery, he recommended passing an endotracheal tube and continuing the administration of open ether over that. After the operation the patient should be left on his side with a pillow supporting his chest until complete return of reflexes.

Turning to consider the patient with a full stomach, Dr. Clark reminded his listeners that after an accident food might remain in the stomach for some hours, and that the stomach contents were probably solid. A wide-bore stomach tube should be passed; that usually made the patient vomit. In intestinal obstruction and paralytic ileus the stomach contents were probably fluid. In those cases it was necessary to pass a stomach tube and leave it down throughout the operation. He did not consider an ordinary narrow Ryle's tube sufficient; one about size 16 or a simple wide-bore tube should be used. It was also essential to pass a cuffed endotracheal tube in such cases before the abdomen was opened. Open ether could be continued, the endotracheal tube being used as an airway.

Dr. Clark then warned that tonsillectomy was one of the most important causes of anæsthetic death in a fit patient. It was nearly always due to anoxia, caused by an obstructed airway, or by inhalation of blood, either during or after the operation. Also, every now and then a death occurred from post-tonsillectomy bleeding. In thyroidectomy, Dr. Clark said that open ether was quite satisfactory, but the anæsthetist must be able to pass an endotracheal tube if necessary. In obstetrical operations the main danger was a full stomach. At the Royal Women's Hospital in Melbourne 80% of forceps deliveries were done under local analgesia. It was very important to avoid anoxia, and if there was any danger of vomiting, it was better to perform the induction with ether only.

Dr. Clark next considered thiopentone as an anæsthetic agent. After listing 11 points to be borne in mind in administering this anæsthetic, he pointed out that the total amount of thiopentone needed might be greatly reduced by combining it with an intubational anæsthetic. He recommended nitrous oxide and oxygen, with or without "Trilene". The latter combination produced very pleasant anæsthesia with a quick recovery time. The main advantage of "Trilene" was that it was not inflammable, and it was suitable for most operations outside the abdomen. It tended to produce tachypnœa, and the amount of "Trilene" being administered should be reduced if respirations rose above 40 per minute.

Dr. Clark expressed the opinion that a short-acting relaxant, such as scoline, was the only relaxant which should be used by the general practitioner unless he was giving anæsthetics with relaxants almost every day. Finally, he said that no anæsthetic should be given unless the anæsthetist could deal with any emergency which might arise. That involved having some means readily available of applying suction and of giving oxygen under pressure, and both could be provided from a very portable apparatus.

S. V. MARSHALL (New South Wales) stressed the importance of retaining "open ether" for teaching purposes. Dr. Marshall also mentioned the potent effect of too much ethyl chloride or ether in causing coughing.

DR. PUGH (Tasmania) said that he had been brought up in Edinburgh, and he asked whether chloroform was safe in obstetrics, and whether it was much used in Australia.

Dr. Clark, in reply, said that chloroform methods of anæsthesia were not taught in Australia, and so were not regarded as safe, quite apart from the known and accepted dangers of chloroform.

G. R. TROUP (Western Australia) said that respiratory depression might occur with thiopentone used for induction of anæsthesia, and might be sufficient to require assistance to respiration.

W. H. J. COLE (Victoria) said that oxygen should always be administered during an "open drip" ether anæsthetic

to guarantee full oxygenation. Mathematical calculation showed that even a small addition would greatly increase the concentration in the alveolar gases. Ethyl chloride (boiling point 12° C.) vaporized immediately it reached the cloth mask, until the temperature of the latter had fallen enough for liquid ethyl chloride to remain. If at that point relatively warm ether was poured onto the mask, the ethyl chloride would vaporize and possibly dangerously anæsthetize the patient. Posture was important in an "open drop" ether anæsthetic, as a dependent position of the head was followed in an hour or two by œdema of the soft palate and aryepiglottic folds, with impairment of the airway. Attempts had been made to teach students to administer simple anæsthetics with a machine. In general students were not able to adjust the face mask sufficiently well for that method of teaching to replace the "open drop" technique.

A. P. McPHATE (Victoria) asked whether intubation and packing of the pharynx were a recommended routine method for dental anæsthesia.

Dr. Clark, in reply, said that they were. It was an advantage if a general practitioner had the necessary skill and equipment to carry out the procedure.

R. R. ROGERS (Western Australia) asked what were the dangers of using thiopentone in dental work.

Dr. Clark, in reply, said that the dangers were respiratory depression, laryngeal spasm, and aspiration of teeth, amalgam and blood.

M. C. PIERCY (Tasmania) asked how long beforehand Dr. Clark gave "Phenergan" for premedication.

Dr. Clark, in reply, said that he gave it half an hour before.

Lumbar Epidural Anæsthesia.

J. H. TAYLOR (Tasmania) read a paper entitled "The Practical Management of Lumbar Epidural Anæsthesia", in which he outlined a simplified method, stressed some of the special problems and suggested ways in which certain common pitfalls might be avoided. He said that those anæsthetists who had served their apprenticeship before the advent of muscle relaxants would remember those abdominal operations conducted solely under spinal analgesia, in which the peaceful and completely relaxed abdomen and the almost bloodless surgical field seemed at the time to provide ideal facilities for the surgeon. They must also remember the hazards associated with the introduction of chemical substances into the subarachnoid space, the increased incidence of post-operative morbidity, and the occasional tragic neurological sequelæ. It was therefore not surprising that when muscle relaxants made the modern concept of balanced anæsthesia an everyday occurrence, a generation of anæsthetists had grown up to whom the spinal needle was little more than an historic landmark. While there was little doubt that muscle relaxants in the presence of controlled respiration afforded ideal operating conditions in the upper part of the abdomen for a partial gastrectomy, the same could not always be said in relation to a total hysterectomy in an elderly, obese female. It was in such pelvic operations that epidural analgesia provided a safe and acceptable alternative, with all the advantages of a subarachnoid block and none of its associated dangers.

Dr. Taylor went on to say that experience had shown that for very poor risk patients and for subjects in whom even a temporary lowering of blood pressure might prove fatal, epidural analgesia was best avoided. Otherwise, it was his practice to use that method for all major lower abdominal operations and for gynæcological repairs, in which the absence of capillary oozing without an undue fall in blood pressure was of particular advantage. Dr. Taylor described the relevant anatomy, and then referred to the identification of the epidural space, which he said might be demonstrated by the insertion of a lumbar puncture needle in the mid-line of a lumbar intervertebral space. When the point was felt to encounter the resistance offered by the *ligamentum flavum*, the stylet was removed and a drop of saline was placed on the hub of the needle. On further advancement of the needle, the drop of saline was promptly sucked inward, owing to the negative pressure which was normally present in the extradural space. The use of Odom's indicator provided an improvement on that method.

Unfortunately for the accuracy of the method mentioned, the negative pressure within the epidural space could not always be demonstrated. Thus, if reliance was placed solely upon visual proof of the correct placement of the needle point, there was an increased chance that the latter might be advanced until it punctured the theca and a spinal tap ensued. A rather more accurate method of identifying the epidural space was the loss of resistance test originally propounded by Dogliotti; that method had been used as a routine during the last three years. It depended upon the recognition of a sudden release of resistance accompanying the passage from the tough *ligamentum flavum* into the epidural space, and was most readily experienced with a large-bore needle carrying a short bevel. The needle was introduced as for the hanging drop test until the point was felt to encounter the *ligamentum flavum*, when the stylet was removed. A 20 millilitre syringe was filled with the analgesic solution and was attached to the spinal needle. Pressure was exerted on the plunger of the syringe, and both syringe and needle were advanced together. While the needle point was still in the ligament, there was a relative resistance to injection; but as soon as the point emerged into the epidural space, the plunger surged forward with the disappearance of resistance, and injection became as easy as discharging the syringe into an empty space. Since the appreciation of the loss of resistance was greatest when a syringe of large capacity was used, it was recommended that a 20 millilitre syringe be used rather than one of a smaller capacity.

Dr. Taylor then said that it was important that the patient should have adequate premedication and that he should also be cooperative. It was often useful to explain the procedure to him beforehand. If he was a fit adult, an intramuscular injection of promethazine (50 milligrammes) together with "Omnopon" (one-third grain) and scopolamine (1/50 grain) was given one hour before he was taken to the operating theatre, and that ensured a tranquil and manageable patient. The injection was best given with the patient lying on his side on the operating table, with his neck and thighs flexed, and with his back parallel to and immediately over the edge of the table. When analgesia up to the fourth dorsal segment was required, the table should be placed in a head-down slope so that a tilt of approximately 8° was imparted to the spine. The anæsthetist, who should scrub up and wear sterile gown and gloves, prepared the skin of the back with a suitable antiseptic solution applied by a swab held in the jaws of a sterile forceps which had been selected from the epidural tray. That tray, together with the instruments, syringes and all drugs used for the injection, had previously been autoclaved. The instruments in the epidural tray were kept to the minimum; they included three all-glass syringes with smooth-fitting pistons of 20, five and two millilitre capacity. Two size 19 B.W.G. Howard Jones epidural needles with stylets and one fine hypodermic needle were placed together in a test tube, together with a file for ampoules. Ampoules of lignocaine, "Nupercaine" solution (1/300) and one of adrenaline tartrate solution (1/1000) were placed in specially made compartments in the linen roll. An ampoule of "Nupercaine" (1/200) with glucose (6% solution) was a useful addition in case a subarachnoid block was performed. A bundle of small swabs, a pair of artery forceps, two small gallipots and a towel with a small central hole completed the assembly. A skin weal was raised over the appropriate intervertebral space with a little of the analgesic solution which was intended for the epidural block. Adrenaline was also added in the proportion of 0·25 millilitre of the 1/1000 strength to each 50 millilitres of analgesic drug. The Howard Jones needle was then passed through the skin weal and the epidural space identified by the loss of resistance method already described. A firm, braced grip on the needle and a slow, controlled advance were the most essential conditions of the technique. All jerky move-

ments should be avoided, and the needle halted immediately the epidural space was entered. To that end, the standing position as advocated by Bromage was best, with the hand and eye over the work, and with the needle grasped between thumb and forefinger of the left hand, which was supinated and braced against the patient's back for added stability. The important landmark was the identification of the *ligamentum flavum* with the point of the needle. Once that resistance was felt, the 20 millilitre syringe filled with the analgesic solution was attached to the needle, and firm continuous pressure was applied to the plunger with the ball of the right thumb. As the syringe and needle were both slowly advanced, the loss of resistance was immediately apparent by the easy and effortless inward movement of the plunger. The syringe was then detached from the needle, and an empty two millilitre syringe substituted. Suction was applied in an aspiration test to exclude the presence of cerebro-spinal fluid. If the result was negative, the injection of the predetermined dose of analgesic drug from the 20 millilitre syringe might be given. As an additional precaution a pause of six minutes could be made after epidural injection of only eight millilitres of the drug. At the end of that time the ability of the patient to wriggle his toes demonstrated that the solution had not inadvertently been injected into the subarachnoid space. The type of analgesia produced in an epidural block was predominantly sensory, since the more heavily myelinated sheaths investing the motor nerves were but poorly affected by the weak solution of drugs used. That resulted in a true differential block, in which the intercostal muscles were fully active in the presence of a flaccid abdomen. In that way, with a sensory loss up to the fourth dorsal segment, the patient had an undiminished respiratory excursion and anoxia was avoided.

Referring to the duration of analgesia, Dr. Taylor said that in the single dose method he had described two drugs were available. When the operation was not expected to last more than two hours, a 1·2% solution of lignocaine was preferred. For procedures estimated to exceed two hours, the drug of choice was a 1/600 solution of "Nupercaine" in normal saline. Both drugs produced good analgesia in those concentrations, that from lignocaine being somewhat more intense and becoming complete within ten minutes of injection, whereas up to 25 minutes must be allowed to elapse with "Nupercaine" before the surgeon could make his incision. Both drugs might be autoclaved without significant loss in potency. The calculation of dosage had to take into account three factors: (i) the number of spinal segments which it was desired to block; (ii) the length of the patient's spinal column; (iii) the age of the patient. The last was especially important. In general for a fit patient of average height in the third or fourth decade of life, 20 to 25 millilitres of 1·2% "Xylocaine" solution were sufficient for operations on the perineum, 30 to 40 millilitres for procedures up to the tenth dorsal segment, and 40 to 50 millilitres for upper abdominal operations. In that last group it was recommended that the needle puncture be made in the first lumbar intervertebral space. When "Nupercaine" was used, those amounts should be increased by about 15%. Dr. Taylor said that upon completion of the block, it was his custom to induce light sleep anæsthesia with 300 to 400 milligrammes of thiopentone, followed by the inhalation of nitrous oxide and oxygen. While unconsciousness was by no means essential it was generally more acceptable to the patient, and also to the operating theatre personnel.

Dr. Taylor went on to say that some lowering of the systemic blood pressure was an invariable accompaniment of successful analgesia above the level of the first lumbar segment. In the normotensive patient that was a desirable feature, provided that the anæsthetist had the blood pressure under constant control by appropriate means. An essential point was careful recording of the pulse, blood pressure and respiration rate at intervals of five minutes. Particular attention should be paid to fluid replacement as required. Upon return to the ward, the patient should be nursed flat until the analgesia had worn off. During that period the nursing staff should continue to record the pulse rate and blood pressure, so that any tendency towards hypotension could be corrected. Once sensation had returned, the patient was encouraged to take fluids by mouth and to clear his chest. There was never any need for prolonged rest in the head-down position, as headache due to epidural analgesia did not occur.

Turning to contraindications, Dr. Taylor said that they were the same as for subarachnoid spinal block, and included frank sepsis at the site of the proposed injection, gross deformity of the spinal column and the presence of coexisting neurological disease. Complications included massive subarachnoid injection (which should rarely occur), neurological complications (no reports of permanent neurological damage following epidural analgesia had been encountered in the literature), and toxic drug reactions, which might sometimes occur, either from so-called idiosyncrasy to the drug or from too rapid a rate of absorption into the blood-stream. The last mentioned might be avoided by the use of adrenaline in a 1/150,000 solution with the analgesic drug. Minor toxic manifestations, especially with lignocaine, were prone to occur when an epidural vein was accidentally punctured. If the appearance of blood from the epidural needle indicated that, it was wise to abandon the block and induce general anæsthesia.

L. G. B. CUMPSTON (Western Australia) gave a warning about the placing of the needle in the "loss of resistance" test and stressed the necessity of making sure that the plunger of the syringe moved easily.

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Symposium on Psoriasis.

C. ROBINSON (New South Wales) took as the subject of his presidential address "Psoriasis—History of, Ætiology and Treatment". He said that it was on the observation of the ancient Greeks that Celsus, a Roman physician, in A.D. 43 gave the first recognizable description of psoriasis. Not until the time of Willan (1757-1812) 1800 years later was that description improved upon. Celsus gave two descriptions of the condition—(i) under impetigo and (ii) under vitiligo. After Celsus came the writers of the Byzantine period, who produced many amusing articles, but contributed nothing to the cause, cure or description.

The Arabian school of medicine had the disease so confused with scabies, leprosy and other skin diseases, that it could not be recognized from their writings. Next came the Middle or Dark Ages, when nothing original was written about skin diseases. Roman and Grecian descriptions were rehashed, and frivolous commentaries were made on them. No distinction was made between psoriasis and leprosy, and though the Neapolitan disease was recognized at the siege of Naples, all sufferers from leprosy, psoriasis or scabies were killed by mercury, or burnt at the stake, or made to travel around in silence or isolation. Dr. Robinson then said that the next contribution came from Willan. He gave an excellent description of the disease though, like Celsus, he made terminological errors. Then came Unna, Hebra, Darier and others, the fathers of modern dermatology. Their description, though accurate, did not improve upon the original descriptions of Celsus or Willan. Dr. Robinson said that one should not be too hard on those men, because even to the present day dermatologists did not always pick psoriasis. He had read that at a meeting at New York, in 1929, there was a debate as to whether the patient had psoriasis or leprosy. The history of the therapy was brief; it comprised (i) the weird remedies of ancient Egypt—semen, sputum and viper's broth, (ii) sulphur at the time of Celsus, (iii) mercury and all the remedies of ancient Egypt revived from the Middle Ages to the nineteenth century and (iv) the final discovery of chrysarobin in the nineteenth century. Referring to the ætiology, Dr. Robinson said that in ancient times, every conceivable condition was blamed. In modern times, there were considered to be four ætiological factors, metabolic derangement, genetic aberration, endocrine dysfunction and psychic disturbance.

E. L. SUSMAN (New South Wales) read a paper entitled "Psoriasis—A Physician's Evaluation". Discussing first ætiological concepts, Dr. Susman referred to the influence of unfavourable climatic and meteorological factors, and said that the disease might be a breakdown of adaptation in a person constitutionally susceptible to those adverse conditions. Dr. Susman pointed out that psoriasis was reported as being found in association with other diseases —ocular abnormalities, arthritis or rheumatic fever. The association in his opinion was often coincidental and largely mythical. He then said that in spite of the existence of psoriatic variants, psoriasis retained its own characteristics and natural history. It was very ectodermal. There was some justification for speaking of the epilepsies, the diabetides, the nephritides, the sarcoidoses, but none for the psoriases. Dr. Susman then mentioned the concept of psychiatric factors in the ætiology. He said that the great majority of patients bore their affliction with fortitude and resignation. In other words, a normal mentality characterized the disease. Timidity, moodiness, compensatory aggressiveness, anti-social conduct and exhibitionism were occasional psychiatric accompaniments. Bottled-up emotions exaggerated hundreds of disease patterns, and were by no means confined to psoriasis.

Dr. Susman then referred to treatment, which he said read like a witch's cauldron. The modern master of the disease was Ingram of Leeds. He was the high priest of an elaborate, almost religious ritual. The routine was strict and salutary, and as beneficial as the unguents.

E. J. C. MOLESWORTH (New South Wales) read a paper entitled "The Ætiology and Treatment of the Various Clinical Variants of Psoriasis". Referring first to the ætiology, he said that there was a familial incidence, or more accurately, an inborn predisposition to attacks of the disease. Stress and other psychosomatic influences might be involved, as might naso-pharyngeal and other infections. There might be hormonal influences, especially at puberty and the menopause. Intercurrent disease might influence the occurrence of psoriasis, as might local injury to the skin—abrasions or subsiding exanthemata. Physical agents such as sunlight might play a part. It was important to realize that psoriasis was a pattern of reaction rather than a specific disease. Discussing the symptoms and physical signs, Dr. Molesworth referred to the distribution of the lesions, and the characteristic plaque with the silvery scale. He described the guttate and pustular variants, and mentioned psoriatic arthritis. He said that the blood uric acid level was raised in the disease, and mentioned the exfoliative variant of psoriasis.

Turning to treatment, Dr. Molesworth said that the first step was to exclude intercurrent disease, and to determine the nature of the psychosomatic problems, if any. He discussed in detail local treatment by the methods recommended by J. T. Ingram of Leeds, and deplored the use of X-ray therapy. He also mentioned the use of hormone therapy. Dr. Molesworth mentioned the influence of the patient's age on the prospects of a remission, and the influence of the patient's personality pattern in predicting the response to treatment. He urged that the patient should not be encouraged to abandon all hope of a remission, and stressed the need to treat the patient rather than the disease.

H. J. C. ENGISCH (Tasmania), in opening the discussion, said that he had gained the impression, from the three excellent papers, that psoriasis was a disease of civilization, and that any authoritative form of treatment, coupled with patient understanding, was likely to succeed. That was in accord with the occasional dramatic effects of high-pressure hypnosis, and suggested the quasi-philosophical idea that, as in some of the so-called psychosomatic disorders, psoriasis was a disorder of group-cohesion. The group animal presented a collective front to the stresses of the universe, and was physiologically designed to partake of group-protection. Civilization disrupted the instinctive working of the human group, and the individual was exposed to stress without the benefit of group security. The skin was the chief medium of contact between the discrete body and the immediate physical environment, and probably existed solely for that purpose. In psoriasis, it might be that the individual, working against stress relatively alone, was attempting at an unconscious level to make group contact through skin, instead of empathy, and was overloading it. The two photographs of the one patient with syphilitic lesions becoming psoriatic provided an example. The diagnosis of syphilis put the patient outside the group through shame; the same areas of skin were used in an attempt to bring her back into the fold.

Dr. Engisch went on to say that the exhibition of purposeful authority, compassionate listening and interest, or even enthusiasm, would do much to resolve the lesions, as the papers presented at the meeting had shown; it could be that it worked by stimulating the instinctive inherent ability to accept leadership, the most important factor in the group-cohesive instinct, and that, in turn, produced faith and hope, the other main factors. The psyche then assumed its proper role in group-cohesion, and the skin was relieved. In deep hypnosis, the operator exerted the strongest instinctive group authority at present available, and in Dr. Engisch's experience deep trance alone was therapeutic; whereas specific suggestion, hypnotic or otherwise, was not only often unnecessary, but sometimes confusing, and even harmful. In short, psoriasis was a deficiency disease—deficiency of empathy. The speakers, in endeavouring to minimize the psychological factor, had successfully highlighted it.

J. C. BELISARIO (New South Wales) thanked the participants in the symposium for their excellent presentations. He said that he could not agree with Dr. Susman that the diagnosis of psoriasis was always clear; it could at times be extremely difficult, particularly from the clinical appearance. As an example, there was the borderline eruption between dysseborrhœic dermatitis and psoriasis, which could not be placed in either category, and was thought by some to comprise a separate entity. He had been pleased to discover that Dr. Susman had recently "seen the light", in that he did not now attribute the same degree of ætiological significance to psychosomatic factors in psoriasis as he used to do. Dr. Belisario thought that most people would agree that solar radiation had a greater beneficial effect than ultra-violet radiation on psoriasis. In the January, 1958, edition of the Schoch Letter, Sulzberger and Witten (1957) were quoted as

having administered 8-methoxypsoralen orally, 20 milligrammes from a half to two hours before the application of suberythema doses of hot quartz-ultra-violet radiation. They obtained no better results than with older methods of treatment without oxypsoralen. Schoch further stated that aminopterin was still considered as a dangerous drug in the treatment of psoriasis, and its effects were only temporary. He also mentioned hearing at the last meeting of the American Academy of Dermatology and Syphilology (December, 1957) that psoriasis was believed to be definitely hereditary, and was probably predicated on some definite enzyme mechanism in the skin. Finally, Howarth and Teichman (1957) had found "Chloranil" (10%) in "Carbowax 1500" to be more than usually efficacious as a local application.

The Place of Radiotherapy in the Treatment of Diseases of the Skin.

W. W. LEMPRIERE (Victoria) read a paper entitled "The Place of Radiotherapy in the Treatment of Diseases of the Skin", in which he briefly traced the development of radiotherapy from the discovery of X rays by Röntgen in 1895 and the isolation of radium by the Curies three years later. Dr. Lempriere said that pioneer discoveries soon led to rapid advances by cooperation between physicists and clinicians, and technical improvements were balanced by a wealth of clinical experience. The main functions of radiotherapy were destructive, anti-inflammatory and anti-pruritic, and a wide range of skin conditions was covered. With increasing specialization, the treatment of cancer in all tissues became a separate entity, though malignant conditions of the skin were still accessible to the dermatologist. Dr. Lempriere pointed out that advances in nuclear physics had enlarged the field. Similarly, there had been since the war many changes in dermatological pathology and in the treatment of skin conditions; but a thorough training in radiotherapy was still considered essential. Dr. Lempriere finally said that modern medical ideology demanded a stocktaking of old remedies and a reassessment of proved weapons backed by clinical experience.

E. H. TAFT (Victoria) read a paper on the use of radiotherapy in the treatment of benign diseases of the skin. He said that the effects of radiation in benign dermatoses might be classified in four groups: (i) cellular nutrition changes (most pronounced in young and active cells); (ii) inhibition and atrophy of cutaneous appendages (hair, nails, sebaceous glands, sweat glands, apocrine glands); (iii) modification of environment (a less favourable medium for growth of bacteria and fungi); (iv) anti-pruritic effect. Dr. Taft then listed the benign dermatoses in which radiotherapy was of accepted worth —acne, angiomata, deep fungous infection, infective dermatoses (furuncle, carbuncle), *dermatitis herpetiformis*, eczema, epilation, hidradenitis and hyperhidrosis, hypertrophic scars and keloids, *lichen simplex chronicus*, *otitis externa*, pruritus, psoriasis, pyogenic granuloma, sebaceous cyst, synovial cyst, seborrhœic dermatitis, seborrhœic warts, warts. He said that he had deliberately omited keratoses and keratoacanthoma, which would be better discussed in the section of the symposium dealing with malignant conditions of the skin, although they were in his opinion not malignant. Dr. Taft then discussed radiotherapy in some of the benign conditions listed in relation to the four effects he had mentioned previously, stating the relevant advantages and disadvantages. He said that claims to effectiveness of radiotherapy should not be based on the enthusiasm of the manufacturer or early users, however eminent. Only in recent years had an attempt been made to subject topical medication in general and radiotherapy in particular to serious scientific assessment. Some doubt had been passed on the efficacy of X-ray therapy. For example, it had been suggested that current X-ray therapy was of less value in pruritus than it had been in the past, and that the older gas tubes with coil and mercury break produced elements in the beam of great therapeutic value, which were absent from the present-day apparatus. The evaluation of X-ray therapy in non-destructive doses was complicated by its psychotherapeutic potentialities in the lay mind, as well as by the variable natural history of the disease being treated. Dr. Taft said, in conclusion, that radiotherapy had a place in the treatment of benign dermatoses and was a potent and simple remedy in many diseases. Its use was governed by the knowledge, experience and clinical judgement of the dermatologist, who would also treat the patient as a whole, and employ the many and varied alternative and associated treatments, both local and general, that he considered necessary. Radiotherapy was part of, and not a substitute for, the art of dermatology.

D. M. CLARKE (Victoria) read a paper entitled "Malignant Conditions of the Skin." He began by giving a list of conditions which might lead to malignant change in the skin—keratoses, cutaneous horns, chronic solar dermatitis, keloid, cicatrix, long-standing ulceration, X-ray or radium dermatitis or ulceration, the results of occupational hazards, leucoplakia, nævi, sebaceous cysts, syphilitic lesions, *lupus vulgaris*, *lupus erythematosus*, von Recklinghausen's neurofibromatosis, *xeroderma pigmentosum*, erythroplasia of Queyrat, Bowen's disease, keratoacanthoma and possibly *cheilitis glandularis*. He said that of those, irradiation was a possible mode of therapy for keratoses including seborrhœic wart, cutaneous horns, keloid, leucoplakia, keratoacanthoma, erythroplasia of Queyrat and Bowen's disease. For the others, if any treatment was required, there were other preferable means. Of the truly malignant conditions, all could be, and often were successfully, treated by means other than radiotherapy. Radiotherapy should never be considered for the treatment of nævus-cell moles and malignant melanoma. For the treatment of a large number of basal cell and squamous cell carcinomata, radiotherapy held pride of place, chiefly for cosmetic and socio-economic reasons. Dr. Clarke enumerated the contraindications to radiotherapy, and said that in some cases the application of radium was to be preferred to X-ray therapy.

H. A. S. VAN DEN BRENK (Victoria) said that the suppression of function by irradiation of glandular structures was largely due to atrophy of such structures and cell death. As long as a cell survived irradiation, its functional activities usually remained relatively intact. He had been surprised to hear keloids classified as precancerous conditions. For carcinoma *in situ*, he favoured irradiation as a treatment *par excellence*. The treatment of pigmented moles and melanomata disturbed him greatly. He had had the repeated misfortune to see patients, previously treated for months with caustics, acids, diathermy and similar methods for a pigmented lesion, presenting with residual primary tumour and lymph node metastases. It was high time that the medical profession realized that a suspicious melanotic lesion should be adequately excised and submitted for full pathological examination. Whilst surgery was the prime method of treatment, irradiation was a valuable method for the control, often lasting many years, of advanced melanoma and clinically evident secondary deposits. He was surprised that the routine follow-up investigation of patients with multiple solar keratoses was rejected as unnecessary. In his experience a considerable proportion of such patients developed frank carcinoma of the skin, and he would unashamedly continue the routine review of such patients. Dr. Van den Brenk said in conclusion that the suggestion had been made that dermatologists should have the monopoly of diagnosis and treatment of skin cancers. His answer was that that privilege belonged to the specialist who could treat such lesions with the best results.

J. C. BELISARIO (New South Wales) said that he would endeavour to add a little more to the excellent historical survey presented by Dr. Lempriere. It might be interesting to remember that Geissler, in 1859, had constructed a vacuum tube in which he showed that a luminous stream produced by a current between terminals could be deflected by a magnet. Sir William Crookes had later devised a pear-shaped tube, and found that radiation focused from the cathode onto the glass wall of the tube caused that area to become hot. He called that stream of radiation cathode rays, and believed that it was composed of par-

ticles. Still later, Lenard had found that those rays penetrated substances opaque to ordinary light, and that after they had done so they were capable of causing fluorescence of platino-cyanide of barium and could also affect a photographic plate. There was little doubt that Lenard had discovered X rays but failed to recognize them. In 1895 Röntgen found that those rays passed through various substances roughly in accordance with their density, and that they developed on the glass wall of the tube at the point of contact with the cathode rays. As he could not determine their nature, he called them X rays. By protecting photographic plates from ordinary light he obtained a shadowgraph of the bones of his hand. That was the birth of röntgenography. A month or two later, Schiff and Freund suggested the use of X rays for treatment, after noticing that erythema of the skin followed exposure to them. This was the birth of röntgenotherapy. In 1899, Stenbeck of Stockholm was the first to present the result of treating a rodent carcinoma with X rays before the Swedish Medical Society. Sjögren presented a similar case at the same meeting. The earliest reports of such therapy in Europe came from Sederholm (1899) and Sequeira (1901), in the U.S.A. from Merril (1900), and in Australia from Bennet, McMurray, Lawrence and Molesworth. There appeared to be a tendency to return more to the use of beryllium window or grenz rays, since they could now be measured more accurately. They had the advantage of sparing underlying structures owing to their superficial penetrability, and could also be employed more often than conventional dermatological X rays. However, Witten and Baer were of the opinion that 85*r* of X rays (half-value layer 0·9 millimetre of aluminium) given weekly appeared to be more effective and to last longer than 200*r* of grenz rays.

Dr. Belisario then drew attention to a phenomenon he had encountered in 1939, which had received little or no attention in the literature until recently. It was the extra degree of erythema (or tissue reaction) which occurred after exposure to X radiation or radium radiation, and which was not accounted for by the delivered dose combined with the estimated backscatter. For want of a better name he had originally referred to that effect on the tissues as "the tissue injury factor", and had later postulated the formation of a "diffusible substance" as causing that extra reaction.

It was interesting to read now that Witten *et alii* in 1957 had noted that they could produce erythema of the skin with a polonium plaque, which produced only alpha radiation which did not penetrate as far as the blood vessels. They also postulated the production of a diffusible substance. Further suggestive evidence of the production of such a substance was seen in the observations of Heisel *et alii* in 1955 that the application of strontium 90 to tumours of *mycosis fungoides* would cause them to disappear, even though the emitted beta radiation was completely absorbed in the first centimetre of the tissue of the tumour, which might be several centimetres thick.

Dr. Belisario then said, commenting on Dr. Taft's paper, that he amongst many others now found that he was using X radiation and radium radiation less and less. He did not employ them at all for seborrhœic keratoses (warts), which in his experience were radioresistant. However, he still regarded X-ray therapy as the treatment of choice for plantar warts in young people, provided the warts lay over a reasonable amount of supporting tissue. He rarely employed X rays now for acne, *lichen Vidal* or ano-genital pruritus, since those conditions more often than not recurred after irradiation, with the exception of acne, which was, however, usually curable by other methods. *Pruritus ani* was potentiated, aggravated or even at times initiated by an insensible anal secretion. Contact from that could be prevented by aluminium hydroxide cream with great relief, and often cure of the patient. That beneficial effect could be greatly increased by prednisolone ointments such as "Metiderm", "Hydeltracen" or "Neotracindelta", which contained small amounts of neomycin, bacitracin and polymyxin B sulphate. A further preparation, which was to be preferred if there was any suspicion of the presence of monilia, was "Scherisolon", which contained a small amount of hexachlorophene. Two of the current theories as to how X rays relieved pruritus were (*a*) that they reduced surface tension, and (*b*) that they caused dispersion of cell infiltrations, thus relieving pressure on nerve endings.

Commenting on Dr. Clarke's paper, Dr. Belisario said that Miescher, in 1953, had had successful results with high doses of Chaoul radiation for malignant melanoblastomata, as also had Knoll in 1951. Miescher, in 1954, had also quoted good results in 37 cases of Hutchinson's melanotic freckle, using five doses of 2000*r* of grenz rays at intervals of three to four days. With regard to carcinomata on the hands of doctors, Dr. Belisario said that if they were not too large (over 2·0 to 2·5 centimetres in diameter), and not directly involving underlying structures, he preferred the cautery-curette-podophyllin technique from all points of view, since if the healing area became wet, which it need not do, the "Scherisolon" or similar ointment kept it clear of infection. In his opinion the use of X rays or radium rays for solar keratoses was inferior treatment. The advantages of carbon dioxide snow and acetone slush over irradiation were many and included the following: (*a*) multiple lesions could be treated in a few minutes as against an hour or more; (*b*) treated areas healed in seven to ten days, against three to six weeks; (*c*) the cosmetic results were perfect, whereas telangiectases and other sequelæ almost always followed a dose of 1400*r* of X rays—the minimum reliable dose for an individual keratosis; (*d*) the snow therapy could be used as often as required, and on the edge of or actually on a previously treated area if necessary, without fear of later sequelæ. For keloids he had had his best over-all results by excising them or destroying them with a cautery after a course of intralesional injections of hydrocortisone and hyaluronidase followed immediately by X radiation. In his experience, large areas of leucoplakia were best treated piecemeal by snow, the cautry or electrodesiccation, to avoid probable sequelæ following irradiation. His routine procedure was now the cautery-curette-podophyllin or "Synkamine" technique for Queyrat's erythroplasia, Paget's disease of the skin and keratoacanthomata. At present he was investigating the use of intralesional injections of hydrocortisone in the latter condition; fairly speedy resolution of three lesions so treated had been achieved. In Bowen's disease, the best results were obtained by the carbon dioxide snow and acetone routine (large lesions being treated piecemeal), preceded by the cautery if any superficial nodulation was present. The podophyllin or "Synkamine" technique could also be employed, and should always be, if early squamous carcinomatous changes were present. When the ear or nose cartilage was involved, properly fractionated X radiation should be the first method tried, since it rarely failed and left a better cosmetic result than could be obtained by surgical procedures. In the rare case in which failure or necrosis occurred, resort could still be had to the plastic surgeon. As he had pointed out previously, the dermatologist was the best qualified, by the very nature of his specialty, to diagnose lesions on the skin. Also he had more methods of treatment at his command than the radiotherapist or surgeon, and was better able to assess the advantages of those methods for particular cases. It could not be reasonably denied that it would be just as irrational to expect the pure radiotherapist or surgeon to be as proficient in the over-all diagnosis and treatment of diseases of the skin (including tumours) as it would to expect the dermatologist to be proficient in all aspects of radiotherapy and surgery. Nevertheless, the best over-all results for the patient were obtained by collaboration between the three specialties, since no one method of therapy was invariably the method of choice in all cases.

In reply to Dr. Van den Brenk, who had said that he would regard radiation as the method of choice for Bowen's disease, Dr. Belisario stressed the excellence of the cosmetic results, which had stood the test of time, obtained by carbon dioxide snow supplemented, when necessary, by the cautery. With the size of the dose of radiation necessary to cure Bowen's disease (essentially a superficial

one, even though it was carcinoma *in situ*). It was impossible to avoid in almost all cases the later appearance of unsightly telangiectases, pigmentation and atrophy. Also such an area was always a potential hazard for the occurrence of necrosis and ulceration following accidental trauma.

Modern Dermatology Overseas.

I. O. STAHLE (Victoria) read a paper entitled "Modern Dermatology Overseas", in which he related his experiences during a seven months' dermatological tour through the U.S.A., the United Kingdom and Continental countries including Czechoslovakia and Russia. Dr. Stahle discussed the present status of five modern methods commonly used in the treatment of dermatoses from the general practitioner's point of view. The methods were: (i) antimicrobial (antibiotics and vaccines); (ii) anti-allergic (antihistaminics); (iii) anti-tension (tranquillizers); (iv) anti-inflammatory (steroids and X rays); (v) anti-pruritic (local anæsthetic agents and X rays). Dr. Stahle said that paired comparison placebo techniques were utilized by some authorities, in order to assess the direct results of the use of those five methods. Dr. Stahle critically examined and evaluated their conclusions, and said that it was easy for some doctors to overlook the indirect consequences of the results of those treatment methods. They had considerable influence, not only on dermatological practice and teaching, but also on the general practitioner-specialist-patient relationship, which often suffered from their indiscriminate use. In spite of the efficacy claimed for those five methods, the dermatological problems faced in the treatment of common dermatoses, such as eczema, psoriasis, acne and fungous infection, were much the same as they had been 20 years previously. Dr. Stahle finally discussed modern principles in the management of those disorders, and world trends in superficial X-ray therapy, grenz ray therapy, dermabrasion and skin allergy.

J. C. BELISARIO (New South Wales) said that he thought that the local application of hydrocortisone or prednisolone was perhaps more beneficial than Dr. Stahle's remarks indicated. Their effect appeared to be improved by the addition of small amounts of an antibiotic, such as neomycin, to keep down possible surface infection with organisms. When used in the anal region or in toe interspaces, the preparation "Scherisolon" appeared to be more advantageous, since it contained hexachlorophene which, unlike the antibiotics, was unattended by the risk of causing exacerbation should any mycotic infection be present. Dr. Belisario said that he would like to hear more about the "stripping patch tests"; they could easily improve the efficacy of that procedure. He went on to say that in the December, 1957, edition of the Schoch Letter, mention was made of a new drug for *dermatitis herpetiformis*, "Sul-Spansion" (a sulphonamide derivative), given by Williams of Seattle in doses of half an ounce twice daily. Attention was also drawn by him to the toxic effects encountered by Arnold of Honolulu following the use of "Kynex" tablets for the same condition, although others had produced successful results without side effects. Columbus of San Jose had reported good results in serum sickness types of penicillin reactions with intravenous injections of decholin sodium, five cubic centimetres every day or every second day, together with one tablet of the drug taken orally after meals. In the November, 1957, edition of the Schoch Letter, Pillsbury *et alii* were quoted as having produced relief in 70% of pruritic dermatoses with the exhibition of "Temaril" by mouth, starting with 2·5 milligrammes at night, then three to four times daily, increasing to a total dosage up to 25 milligrammes per day in severe cases. In the February, 1958, edition of the Schoch Letter, mention was made of the newer steroids now on trial—namely, "Medrol", "Aristocort" and "Kenacort". "Medrol" had added a methyl group to the molecule of prednisolone. "Aristocort" and "Kenacort", which were identical, had added a fluorine radical and a hydroxy radical. They were all marketed in four milligramme tablets, which would indicate that they were from 20% to 25% more effective than the parent substance prednisolone. The clinical impression so far gained was that "Medrol" was the less effective of the two. Also "Aristocort" or "Kenacort" surprisingly reduced œdema, unlike fluorohydrocortisone. The dosage was one tablet two to three times per day.

Eczematous Conditions of Infants.

MILES HAVYATT (New South Wales) read a paper entitled "Eczematous Conditions of Infants". He said that the eczema syndrome—erythema with pinhead-sized papules, vesicles, pits, wells and crusts—was frequently seen in infancy. All too frequently was the condition labelled as "infantile eczema", and no attempt was made to discern the pathogenesis of the eczematous dermatitis. Dr. Havyatt went on to say that the eczema syndrome could be a primary manifestation in five conditions. The first was exudative infantile eczema which appeared on the flush areas of the face, the extensor surfaces of the arms and legs and the lower part of the abdomen. The second was dry infantile eczema (neurodermatitis or "atopic eczema"), appearing on the outer borders of the face, the sides of the neck and the flexural regions of the limbs and occasionally the dorsa of the hands. The third was contact dermatitis from environmental contacts, napkin contact, medication. The fourth was organismal eczematoid dermatitis, which appeared on the skin surrounding a discharging sinus. The fifth form comprised drug eruptions. Dr. Havyatt then said that the eczema syndrome could be a secondary manifestation in xeroderma, napkin erupution, monilial infection of the skin, and seborrhœic dermatitis. In all the foregoing conditions the clinical picture might be that of a generalized eczematous eruption due to autoeczematization arising from tissue destruction or inappropriate treatment. Dr. Havyatt finally discussed the differential diagnosis of each condition and gave an outline of therapy.

E. H. TAFT (Victoria) referred to the sensitivity of the skin in infantile eczema to tar in ointments. He said that he had been able to use tar ointments in many cases when mercury was added, and thought that the factor producing irritation was organismal rather than allergic. He had found monilia in a considerable number of cases of napkin dermatitis, but had been disappointed with the results of treatment with "Mycostatin" ointment. Irritation had occurred in a high proportion of children, and he had obtained an excellent response to local treatment with gentian violet (0·5%) in water.

J. C. BELISARIO (N.S.W.) said that, in referring to *acne rosacea*, one had to be sure that both acne and rosacea were present together, since the term should not be employed in the absence of comedones. His own concept of the definition of atopy was now that it comprised an inborn tendency to acquire an altered capacity to react. That was influenced by an imbalance between the skin, the endocrine system and the nervous system. The picture of the dermatitis around a colostomy which Dr. Havyatt had shown brought to mind the origin of the use of aluminium hydroxide cream for *pruritus ani*. It was noted that surgeons used to employ aluminium hydroxide paste to protect the skin around colostomies from anal secretions, and so for the same reason it was tried on the anus with much benefit. That particular patient (one of his own) was quickly relieved of the dermatitis by the use of the same cream. The oral administration of *d*-l-methionine was of considerable benefit in the treatment of napkin dermatitis. Although diet was rarely of benefit in infantile dermatitis, a change from the breast to "Lactogen" or from "Lactogen" to goat's milk or the soya bean substitute might occasionally cause marked improvement. As a cleansing agent he preferred equal parts of homogenized liquid paraffin and water. If bathing was permitted, a teaspoonful of bicarbonate of soda should be added to each pint of water. The least irritant soap on the market at present appeared to be "Neutragena" soap. Dr. Belisario finally said that he heartily agreed about the efficacy of the local application of hydrocortisone or prednisolone preparations.

Dr. Havyatt, in reply, said that many things had been mentioned in the discussion which he regretted not having

mentioned. However, the subject was a vast one, and to cover it fully would require far longer than was permitted. Dr. Kelly had asked whether he used the steroids internally. He did not. It must be remembered that after steroid therapy, with the use of cortisone or the more recent developments, there was suppression of the renal cortex, and at a later date—some said within a period of two years—should the child become ill, then it was advisable to give steroids in small doses during that illness. For that reason he did not give steroids, since, if the child did become ill later, the parents would not normally seek the advice of a dermatologist. He asked a pædiatrician to supervise steroid therapy; then the appropriate person had knowledge of the therapy, should it be required again at a later date. With regard to atopic erythroderma, Dr. Havyatt said that the general opinion was that steroid therapy was most valuable in that usually resistant condition. Dr. Belisario had questioned his terminology, stating that *acne rosacea* could not be diagnosed unless comedones were present. Dr. Havyatt said that most texts emphasized the fact that there were few if any comedones in that condition. However, he agreed with Dr. Belisario that the term should not be used until there were acneiform pustules besides rosacea.

Quiz Session.

A dermatological quiz session was held, the panel comprising the following: W. Lempriere (Victoria), W. Jamieson (Victoria), E. H. Taft (Victoria), R. F. A. Becke (New South Wales), E. J. C. Molesworth (New South Wales) and J. C. Belisario (New South Wales).

Diagnostic Aids in Dermatology.

R. A. LANGLEY (Victoria) read a paper entitled "Diagnostic Aids in Dermatology". He said that skin diseases were readily accessible for inspection, and the diagnosis could frequently be confirmed by special tests. Many of the tests were essentially simple office procedures. Clinical aids to diagnosis included the examination of all the skin, the nails and the orificial mucous membranes, examination of internal organs, and various special tests such as diascopy, paring, the use of Wood's light and allergy tests. Chemical aids to diagnosis included urine tests, estimation of the hæmoglobin value and serum analysis. Microscopic examination of specimens taken from skin lesions permitted identification of infesting insects, fungi and bacteria, and special techniques revealed the histology and cytology of the lesions.

J. C. BELISARIO (New South Wales) said that a quick examination for the *Microsporon furfur* could often confirm the diagnosis. A strip of Scotch tape was applied to an affected area and pulled off sharply. It was then fixed to a glass slide with the collected surface-skin debris between the two, and could be examined at once with the microscope. Dr. Belisario then said that squamous carcinomata took up more than twice as much radioactive phosphorus as normal skin or rodent carcinomata. He further said that Melczer and Kiss in 1957 had described a method of measurement of the electrical potential of the skin for the diagnosis of early cutaneous cancer. The test was based on an increase in permeability which occurred at the site of an injured area and induced a positive potential; in other words, the surface of the cancerous growth was less negative than its normal environment. The method was inapplicable to eroded or ulcerated areas, since the injury potential increased permeability, even in the absence of malignant change. In the case of an amelanotic malignant melanoblastoma, if a biopsy specimen was incubated in tyrosine, it became grossly black. Dr. Belisario finally said that Bauer and Steffan in 1955 had found, with the aid of a Geiger-Mueller counter, that there were significantly increased concentrations of radioactive phosphorus in malignant melanoblastomata as compared with benign nævi.

Candidiasis (Moniliasis).

M. B. LEWIS (New South Wales) read a paper on candidiasis. He discussed the history and sites of *Candida albicans*, and drew attention to its widespread distribution at various ages, and its prevalence in those occupations associated with maceration and in diseases involving debility, such as diabetes. He said that the incidence of candida infections associated with long courses of antibiotics should be recognized. Vitamin *B* complex was of value. The lowered resistance of the patient had led to fatal generalized moniliasis in one case cited. Dr. Lewis urged that more attention be directed to that possibility with the increased use of antibiotics. He reported an unusual case of *acrodermatitis enteropathica*, the association of which with a familial factor and its treatment with "Diodoquin" were of interest. Dr. Lewis went on to say that the diagnosis of candida infections was difficult. The constant presence of *C. albicans* as a saprophyte had to be taken into account in assessing the pathological findings in direct smears and cultures. Clinical diagnosis was of paramount importance. Dr. Lewis finally enumerated the general and specific features of treatment. He said that "Nystatin" and "Dequadine" were noteworthy and useful preparations, being non-toxic and pleasant to use.

J. C. BELISARIO (New South Wales) said that Bahram and Reiss had found that the best culture medium for the identification of *Candida albicans* with rice infusion agar. They had also noted that all species of *Candida*, and some others, could reduce bismuth on Nickerson's agar, forming brown or jet-black colonies. Dr. Belisario further said that as an alternative to "Mycostatin" by mouth for gastro-intestinal moniliasis, he had found gentian violet in pill form, one grain, or half a grain each of gentian violet and brilliant green, given orally after meals, to be of benefit. Likewise, undecylinic acid given orally might help, but in smaller doses than those recommended by Periman for psoriasis some years earlier; that treatment had not been successful. As prophylaxis against intestinal moniliasis, "Mycostatin" could be given orally with antibiotics when necessary. When the nails were affected, pregnenolone had been recommended for oral administration in daily doses of 500 milligrammes, and also the application of "Chloranil" (from 10% to 25%) in nail polish or paint. A further useful local application was composed of sodium para-aminobenzoate (five grammes), "Tween 80" or Pola wax (two grammes), alcohol and water of each to 100 cubic centimetres. The local application of a 0·1% aqueous solution of bicarbonate of soda prior to other topical applications might materially enhance the therapeutic effect of the latter.

(To be continued.)

Correspondence.

FLUORIDATION OF PUBLIC WATER SUPPLIES.

SIR: The reply of P. R. N. Sutton and A. P. B. Amies (April 26) to my comments on their paper (*M. J. AUSTRALIA*, February 1, 1958) does not negate any statements I made in my letter of February 22.

In order further to clarify the position, I would like to comment on the misinterpretations of my letter by Sutton and Amies.

The historical background to fluoridation studies is precisely the epidemiological evidence of the effect of optimal concentrations of fluoride in drinking water on the dental caries experience of those children who have consumed this water continuously during the period of tooth formation. This has been stated by Ast[1] when the Newburgh Study was inaugurated, and by Frye and Hill[2] in reference to the Evanston Study; and in the report of Dean and co-workers,[3] it is stated in relation to the Grand Rapids Project: "This inverse relationship between dental caries prevalence and fluorides in drinking water . . . led to the proposal that optimal amounts of fluoride be added to the drinking water as a partial caries control measure." The report of the United Kingdom Mission leaves no doubt in the mind of the impartial reader that the summary and conclusions of this report, based on the personal experience of the four authors in North America studying fluoridation, are factual statements supporting the efficacy of fluoridation. "In our opinion the evidence is conclusive that among

children in fluoridation areas there is a reduction in the incidence of dental caries to a level comparable with that experienced where fluoride occurs naturally in the water."[4] The careful and detailed assessment of the results of fluoridation studies before a general recommendation was made in the United States was the real reason for the lag in the application of the fluoridation process, because the American Dental Association and the United States Public Health Service gave their unqualified endorsement only in 1950 and 1951 respectively, when the results of the fluoridation studies had "progressed to a point where we could announce an unqualified endorsement of fluoridation".[5]

If, as Sutton and Amies admit in their original paper, the use of radiographic examinations would eliminate personal bias, is it not a fact that in the Newburgh Kingston Study the clinical results were substantiated by the X-ray findings? This is shown particularly in the ten-year report (1956), which was available before Sutton and Amies's paper was written, and in which they quoted the much less comprehensive report on eight years of fluoridation. Furthermore, in this (1956) report, Ast *et alii*[6] state concerning the commencement of the radiographic survey: "In addition to the clinical examination, roentgenograms were included in the examinations for the years 1949-50, 1953-54, 1954-55." If one wishes to examine the effects of fluoridation in a study where radiographic examination has been used in conjunction with clinical examination from the beginning of the study, then the Evanston, Illinois, report can be selected. Frye and Hill (*loco citato*), in outlining the plan of the study, have emphasized the thorough examination given the children, including six anterior radiographs and two to four posterior films. Furthermore: "The opinion of at least two dentists is obtained before the final number of caries, fillings and immune cases is determined" (Frye and Hill, *loco citato*).

Sutton and Amies have objected that the changes in the DMF rates are given as percentages, yet they have also used percentages in the calculations on which they base their objections; moreover, in all these reports the absolute DMF figures are given as well as percentages, and in the Evanston Study, the more complete expression of dental caries experience as DMF rates per hundred children, per hundred surfaces and per hundred teeth are shown.[7]

The value of fluoridation must be considered from a public health viewpoint, and its effectiveness can be measured by the change in the ratio of filled to unfilled teeth and the number of lost teeth. This latter point concerning the Newburgh and Kingston Study and the ratio of missing first permanent molars was ignored by Sutton and Amies in their comment.

The fact that stands out clearly is that great precautions have been taken, particularly when these studies are compared with other studies, both in dentistry and medicine, where the numbers of subjects involved and the length of time over which the studies extended are very considerably less, and where, in spite of these facts, no objections to the soundness of the conclusions are raised.

Artificial fluoridation studies were planned to test the hypothesis, epidemiologically verified, of the fluoride-dental caries relationship. Surely even statisticians will agree that the experimental verification of the epidemiological findings by a series of independent studies giving uniform results, which were predicted on the basis of the unquestioned epidemiological evidence, satisfy the requirements for valid conclusions.

No manner of statistical analysis will alter the facts obtained by careful clinical examination verified by radiographic examination and the unquestioned integrity of the workers on extensive and representative samples of population. If the interpretations that are given these facts by statistical methods do so, then it is obvious that mathematical treatment of the data has no real value.

It is not conceivable that all those persons comprising the bodies who have examined the evidence in favour of fluoridation are so statistically naïve that they have given their opinion without due consideration of the facts.

No community deprived of the benefits of fluoridation will appreciate the objection that it "would seem desirable" that an improved method of assessing changes in the DMF rates be devised while their unmet dental needs continue to accumulate at a statistically significant rate.

Yours, etc.,

NOEL D. MARTIN,
Associate Professor of Preventive Dentistry.

Faculty of Dentistry,
University of Sydney,
May 23, 1958.

References.

(1) AST, D. B. (1945), "Plan to Determine the Practicability, Efficacy and Safety of Fluoridating a Communal Water Supply, Deficient in Fluorine, to Control Dental Caries", in "Fluorine in Dental Public Health", published by the New York Institute of Clinical Oral Pathology, New York.

(2) FRYE, H. R., and HILL, I. N. (1952), "Water Fluoridation and Dental Research", *J. Am. Water Works A.*, 44: 947.

(3) DEAN, H. T., ARNOLD, F. A., JR., JAY, P., and KNUTSON, J. W. (1950), "Studies on Mass Control of Dental Caries through Fluoridation of the Public Water Supply", *Pub. Health Rep.*, 65: 1403.

(4) "The Fluoridation of Domestic Water Supplies in Northern America as a Means of Controlling Dental Caries", Report of the United Kingdom Mission, London, February to April, 1952, page 19.

(5) "Fluoridation in the Prevention of Dental Caries", 3rd Edition, 1953, American Dental Association, Chicago, pages 18 and 19.

(6) AST, D. B., SMITH, D. J., WACHS, B., and CANTWELL, K. T. (1956), "Newburgh Kingston Caries Fluorine Study XIV. Combined Clinical and Roentgenographic Dental Findings after 10 Years of Fluoride Experience", *J. Am. Dent. As.*, 52: 314.

(7) HILL, I. N., BLAYNEY, J. R., and WOLF, N. (1955), "The Evanston Caries Study XI. The Caries Experience Rates of 12-13-14-Year-Old Children after Exposure to Fluoridated Water for Fifty-Nine to Seventy Months", *J. Dent. Res.*, 34: 77.

"RED RIVER OF LIFE."

SIR: The medical profession may be interested to know of a special screening of the film "Red River of Life" at the University of Sydney on July 2 at 8.30 p.m. This film is the latest production of the Moody Institute of Science (U.S.A.) which makes scientific films for the layman, incorporating Christian doctrine with the object of relating scientific and spiritual truth. This film is the first to be based on the physiology of the human heart and circulation and is the result of more than four years' scientific research. It makes medical and motion picture history by being the first to film the cardiac valves in action, through plexiglas ports let into the ventricles and great vessels of an isolated heart, kept beating in a cardiac pulse duplicator. The use of radioactive isotopes, plastic aortic valves viewed by fluoroscopy, and the artificial heart and lung machine are also seen. The film, which is in colour and lasts seventy minutes, was screened to medical audiences in London last February, where it was enthusiastically received. This meeting, which has been arranged by The Christian Medical Fellowship, is by invitation, and the writer will be glad to send such to any interested colleague.

Yours, etc.,

DOUGLAS T. TRELOAR.

135 Macquarie Street,
Sydney,
May 30, 1958.

THE BOYLE-DAVIS GAG.

SIR: While appreciating Mr. Raymond Hennessy's interesting description of his presence at the advent of the Davis gag in England, I beg to disagree with his contention that Boyle's name should be dropped. Having myself had the pleasure of receiving instruction from the late Mr. H. E. G. Boyle (he was an Honorary Fellow of the Royal College of Surgeons—no mean honour for an anæsthetist in those days), I am in a position to correct Mr. Raymond Hennessy. Boyle seized on the one defect of the Davis gag, namely, that it had to be used in conjunction with a separate hooked anæsthetic supply pipe hung in the mouth. He ingeniously incorporated a supply pipe with the spatula, thus perfecting the Boyle-Davis gag as we know it today and which Mr. Hennessy admits has never been improved. "Cocky" Boyle was a charming, easy-going man with no pretentions to knowledge concerning any specialty that was not his own, and he humbly told me, when asked, the story of his contribution to this instrument which entitles his name to be coupled with Davis.

Yours, etc.,

NORMAN R. JAMES,
Director of Anæsthetics.

The Royal Melbourne Hospital,
Melbourne,
May 28, 1958.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Programme for July.

Week-End Course in the Use of Radio-Isotopes in Medicine.

A WEEK-END COURSE in the use of radio-isotopes in medicine will be held at St. Vincent's Hospital on Saturday, July 26, and at the Royal North Shore Hospital of Sydney on Sunday morning, July 27, 1958. By arrangement with the New South Wales State Cancer Council, the course will be free to all medical practitioners. It has been designed to provide basic elementary data about the physics and the diagnostic and therapeutic value of radio-isotopes in medicine. Lectures will be held from 9.30 a.m. to 5 p.m. on Saturday in the Students' Lecture Room at St. Vincent's Hospital and from 9.15 a.m. to 1 p.m. in the Students' Lecture Room at the Royal North Shore Hospital. Special features of the course include "Production and Availability of Isotopes", "Uses of Radioactive Isotopes in Neurological Diagnosis", "Therapy with External and Implanted Sources", "Uses of Radioactive Isotopes in Hæmatology", "Uses of Radio-Iodine in Thyroid Disease", "Uses of Isotopes in Medical Research" and "Precautionary Measures". A detailed programme will be published shortly.

Course in Cardiology.

A course in cardiology, conducted by the Hallstrom Institute of Cardiology, Royal Prince Alfred Hospital, will be held for one week from Monday to Friday, July 21 to 25, 1958. This year the subjects chosen for discussion will be mainly relating to cardiac surgery, and lectures and demonstrations will be held at the hospital from 2.15 p.m. to 5 p.m.

The course is available free of charge to members of the staff of the Royal Prince Alfred Hospital. Fee for attendance by other participants is £6 6s., and enrolment should be made with the Post-Graduate Committee in Medicine.

Diploma Courses Beginning during July.

Diploma in Clinical Pathology.

A course for Group I (Pathological Anatomy and Hæmatology) of the Diploma in Clinical Pathology of the University of Sydney is due to begin on July 14, 1958, for a period of seven months. Group II (Bacteriology and Parasitology) will begin on September 23 for a period of six months, and Group III (Biochemistry) will begin on September 8 for a period of six months. Fees for attendance are 30 guineas for each group of the course.

Diploma in Anæsthesia.

A course for Part II of the Diploma in Anæsthesia of the University of Sydney is due to begin on July 14, 1958. The duration of this course is three months, with recess period from September 1 to November 14. The fee for attendance is 40 guineas.

Diploma in Psychological Medicine.

A course for Part II of the Diploma in Psychological Medicine of the University of Sydney will begin on July 21, 1958, for a period of seven months. The fee for attendance is 50 guineas.

Diploma in Diagnostic Radiology.

A course for Part II of the Diploma in Diagnostic Radiology of the University of Sydney will begin on July 21, 1958, for a period of eight months. The fee for attendance is 45 guineas.

Information.

Further details concerning these courses may be obtained from the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney, to whom application for enrolment should be made. Telephones: BU 4497-8. Telegraphic address: "Postgrad Sydney."

Examination Results.

The Post-Graduate Committee in Medicine in the University of Sydney announces that the undermentioned candidates satisfied the examiners at the recent examination for Part I of the various medical diplomas of the University of Sydney as shown below.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED MAY 23, 1957.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	4(4)	..	3	..	..	..	..	..	7
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	..	..	..	..	11	..	11
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	2(2)	1	..	..	..	..	..	..	3
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	1(1)	..	..	..	..	..	..	..	1
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	1(1)	11(1)	2(2)	..	..	..	..	..	14
Diphtheria	1	..	..	..	..	..	..	..	1
Dysentery (Bacillary)	..	..	1(1)	1(1)	5(3)	..	2	..	9
Encephalitis	..	..	..	..	..	..	..	..	..
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	52(27)	13(5)	6	1	16(3)	1(1)	..	..	89
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	..	..	1	..	1
Leptospirosis	..	..	1	..	..	..	..	..	1
Malaria	..	..	2(2)[2]	..	..	..	..	..	2[2]
Meningococcal Infection	2	..	..	..	..	..	..	..	2
Ophthalmia	..	..	..	..	4(4)	..	..	..	4
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	1(1)	..	1(1)	..	..	..	..	..	2
Puerperal Fever	..	..	..	..	..	..	..	..	..
Rubella	..	23(18)	..	5(5)	12(12)	..	..	..	40
Salmonella Infection	..	..	..	..	1(1)	..	..	..	1
Scarlet Fever	17(6)	29(17)	7(3)	4(3)	8(8)	3(3)	..	..	68
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	1(1)	..	..	..	..	..	1
Trachoma	..	..	..	..	6(2)	..	1	..	7
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	28(19)	16(6)	8(4)	10(8)	4(3)	4(2)	1	1	72
Typhoid Fever	..	..	..	1(1)	..	..	..	..	1
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	..	..	..	..	..
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.
[2] Infection contracted outside Australia.

Anæsthesia: H. P. Dyer, G. C. Fisk, Vera Gallagher, J. G. Stocks.

Dermatological Medicine: J. S. Brooks, N. A. Gunn, B. M. Hoare, J. H. Steele-Smith, J. A. Tomkins.

Gynæcology and Obstetrics: A. H. Bradfield, H. J. Solomon.

Ophthalmology: C. C. Burnside, L. F. Hann, J. D. Lister, D. C. Swan.

Psychological Medicine: W. A. Barclay, G. M. Collins, J. A. Dobbie, W. B. Grant, J. P. Higgin.

Diagnostic Radiology: J. A. Lyall, W. R. Vautin.

The following candidates were successful in passing the recent examinations for the Diploma in Clinical Pathology. Group I: G. T. Archer, P. D. Dawes, K. M. Mattocks, Phyllis Richards. Group II: K. O. A. Jones.

Week-End Conference at Katoomba.

The Post-Graduate Committee in Medicine in the University of Sydney announces that, in conjunction with the Blue Mountains Medical Association, a post-graduate week-end conference will be held in the ballroom at the Carrington Hotel, Katoomba, on Saturday and Sunday, June 28 and 29, 1958. The programme is as follows:

Saturday, June 28: 2 p.m., registration; 2.30 p.m., "Common Difficulties in Obstetric Practice", Professor F. J. Browne; 4 p.m., "Varicose Veins", Dr. C. H. Wickham Lawes.

Sunday, June 29: 10.30 a.m., "Present Scope of the Pump Oxygenator", Dr. B. C. Sinclair-Smith; 12 noon, "Toxæmias of Pregnancy", Professor F. J. Browne; 2.30 p.m., "Bad Legs and Peripheral Vascular Disease", Dr. C. H. Wickham Lawes; 4 p.m., "Cardiac Pain and Intractable Angina", Dr. B. C. Sinclair-Smith.

The enrolment fee is £4 4s., which includes the Post-Graduate Committee fee of £3 3s. Those wishing to attend the course are requested to communicate as soon as possible with Dr. Nicholas Larkins, Honorary Secretary, Blue Mountains Medical Association, 199 Katoomba Street, Katoomba. Telephone: Katoomba 111.

SEMINARS AT THE ROYAL NORTH SHORE HOSPITAL OF SYDNEY.

THE following is the programme of seminars at the Royal North Shore Hospital during 1958.

July 1: "Anuria", Dr. M. Whyte.

August 5: "Some Indications for Splenectomy", Professor C. R. B. Blackburn.

September 2: "Iron and Anæmia", Dr. R. J. Walsh.

October 7: "Spontaneous Pneumothorax", staff, Thoracic Unit.

November 4: "Changes in Ocular Fundus in Medical Diseases", Dr. K. Armstrong.

December 3: "Clinical Syndromes and Surgery of the Basal Ganglia", Mr. J. M. F. Grant, Dr. E. Davis, Dr. L. S. Basser.

The seminars will be held on the first Tuesday of each month at 5.15 p.m. in the Students' Common Room. At this time on the remaining Tuesdays there is a clinical demonstration.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Nichols, James Johnstone, M.B., B.S., 1956 (Univ. Sydney), 60 Bowman Street, Swansea, 2N., New South Wales.

Sztolcman, Hersz Wolf, M.D., 1940 (Univ. Naples) (provisional registration in accordance with the provisions of Section 17 (1c) of the *Medical Practitioners Act*, 1938-1957), 17 Lorne Street, Summer Hill, New South Wales.

The undermentioned has applied for election as a member of the Victorian Branch of the British Medical Association:

Michael, Terence Thomas Erskine, M.B., 1949 (Univ. Dublin), M.R.C.O.G., The Royal Women's Hospital, Melbourne.

Deaths.

THE following deaths have been announced:

HARGREAVES.—Henry Ellison Hargreaves, on June 4, 1958, at Wahroonga, New South Wales.

LAWRANCE.—Guy Ardlaw Lawrance, on June 4, 1958, at Crows Nest, New South Wales.

SMITH.—Alan Victor Smith, on June 3, 1958, at Collaroy, New South Wales.

Diary for the Month.

JUNE 17.—New South Wales Branch, B.M.A.: Medical Politics Committee.

JUNE 18.—Western Australian Branch, B.M.A.: General Meeting.

JUNE 19.—Victorian Branch, B.M.A.: Executive Meeting.

JUNE 19.—New South Wales Branch, B.M.A.: Clinical meeting.

JUNE 20.—New South Wales Branch, B.M.A.: Ethics Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales.

South Australian Branch (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

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ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

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